Puget Sound Gateway Program – Phase 1 of the SR 167 Completion Project

23 CFR §771.129
Washington State Department of Transportation/Federal Highway Administration

REGION/MODE	SR	PROJECT PROGRAM#	FEDERAL AID #	PROJECT#
HQ/ Mega Projects	I-5/SR 167	M00600R	N/A	316708T, 316707T, 316706T

PROJECT TITLE, ENVIRONMENTAL DOCUMENT TYPE & DATE APPROVED:

1) SR 167 Puyallup to SR 509, Tier II Final Environmental Impact Statement and Section 4(f) Evaluation, November 2006. Approved by signatory agencies Federal Highway Administration, Washington State Department of Transportation, and cooperating agencies U.S. Army Corps of Engineers, and City of Fife on November 9, 2006.
2) Record of Decision for State Route 167 Extension Project Puyallup to SR 509, October 2007. Approved by signatory agency Federal Highway Administration on October 2, 2007.
3) SR 167 Puyallup to SR 509, SR 167 Puyallup River Bridge Replacement Final Supplemental Environmental Impact Statement and Record of Decision. Approved by signatory agencies Federal Highway Administration, Washington State Department of Transportation, and cooperating agencies U.S. Army Corps of Engineers, and City of Fife on November 16, 2013.

REASON FOR RE-EVALUATION:

The purpose of this re-evaluation is to determine whether the first phase of the State Route (SR) 167 Completion Project will have the potential to result in any new significant environmental impacts that were not previously evaluated in the 2006 Final EIS (FEIS) and 2007 Record of Decision (ROD). With the passing of the Connecting Washington Transportation Package in 2015 by the State Legislature, funding has become available for the first phase of the SR 167 Completion Project (Phase 1 Improvements) to proceed through environmental review, design, and into construction. The Phase 1 Improvements include approximately four miles of new limited-access highway with four-general purpose (GP) lanes on the new SR 167 extension (compared to six lanes as analyzed in the 2006 FEIS) from its current terminus in Puyallup at SR 161 to Interstate 5 (I-5), and assumes that all lanes will be tolled using two electronic toll points. The Phase 1 Improvements also include an approximately two-mile "SR 509 Spur" highway section from SR 509 near the Port of Tacoma to the I-5 and SR 167 interchange near 70th Avenue.

The Phase 1 Improvements assume that all lanes will be tolled using two electronic toll points. One toll point will be located on SR 167 between I-5 and the proposed Valley Avenue interchange, the other toll point will be located on the SR 509 Spur between I-5 and the proposed 54th Avenue interchange. Both toll points will be located such that any user of the new Phase 1 Improvements will be charged a toll. The effects related to tolling (which were not previously evaluated) are a key consideration in the re-evaluation, particularly as it relates to transportation and environmental justice effects. Before tolling can begin, a toll authorization bill must be passed by the Legislature. The rate-setting process will be overseen by the Washington State Transportation Committee (WSTC) in advance of completion of the Phase 1 Improvements.

The SR 167 Completion Project is based on nearly three decades of project planning and development. The use of a tiered environmental documentation process was determined to be appropriate at project inception in 1990. In 1993, the Washington State Department of Transportation (WSDOT) released the SR 167 Corridor Adoption Puyallup to SR 509 Tier I Draft Environmental Impact Statement (DEIS). The DEIS identified and analyzed significant impacts along several proposed corridors, and a preferred corridor. Subsequent to release of the DEIS, it was determined by FHWA that the project was required to have a Major Metropolitan Transportation Investment Study (MIS). A steering committee of interested agencies was established, and the committee, utilizing public involvement, evaluated a No Action Alternative, a Transportation Demand Management/Transportation System Management (TDM/TSM) Alternative, the Preferred Freeway Corridor Alternative (Corridor 2 from the DEIS), and a Strategic Arterial Alternative. After extensive evaluation of the cost-effectiveness of a wide array of alternatives, the MIS concluded that construction of a freeway to complete SR 167 would remove one of the major missing links in the freeway system in the region. Considering the findings of the MIS, and following distribution of the Tier I FEIS in April 1999 and consideration of further comments, the FHWA issued a ROD in June 1999 documenting the selection of Corridor 2 as the least environmentally damaging practicable alternative.

Within the selected SR 167 corridor, a No Build Alternative, and a Build Alternative mainline alignment identified in the Tier I FEIS along with various interchange options were evaluated in a project level Tier II Draft EIS, published in 2003. The Tier II FEIS and Section 4(f) Evaluation issued in November 2006, and ROD in October 2007 identified the Preferred Build Alternative. The 2006

Build Alternative included approximately six miles of divided highway, including four general purpose lanes (two lanes in each direction), one high occupancy vehicle (HOV) lane in each direction between SR 161 and I-5, four lanes (two lanes in each direction) from I-5 to 54th Avenue E, and a single lane in each direction from 54th Ave E to SR 509. It also included interchange connections at SR 161 (Meridian), Valley Avenue, a system level interchange at I-5 with direct connect HOV ramps, 54th Avenue E, and direct connection to SR 509. Since the 2007 ROD was issued, the project has moved forward with actions such as purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design.

In late 2007 the WA State Legislature provided funding for the SR 167 Puyallup River Bridge Replacement Project, a smaller but integral part of the larger SR 167 Extension Project. The steel truss Puyallup River Bridge (167/20E), also known as the "Meridian Street Bridge," was originally constructed in 1925 and became eligible for listing on the National Register of Historic Places (NRHP) after the 2006 FEIS was completed. With the new funding, WSDOT completed the necessary environmental review and studies, and in July 2013 WSDOT and FHWA issued the joint "SR 167 Puyallup River Bridge Replacement Final Supplemental Environmental Impact Statement and Record of Decision." The project construction was completed via design-build delivery in 2015. The Meridian Street Bridge is currently situated on the SR 167 alignment immediately west of Meridian Avenue. The SR 167 Project team is currently working with WSDOT HQ Cultural Resources Program on the marketing plan to surplus this bridge in compliance with the Section 106 Memorandum of Agreement (MOA).

In early 2008, the WSDOT's SR 167 design office developed a proposed "refined alignment" for the project within the six-mile corridor. This was the result of an early practical solutions/practical design process undertaken to further reduce project environmental impacts, complexity, ROW acquisition costs, construction costs, and project risks beyond what had been documented in the 2006 FEIS. Although the refined alignment was endorsed by WSDOT Olympic Region Project Development in 2008, and discussed with the WA Division FHWA, it never went through NEPA review. At about this time the SR 167 Project was shelved due to lack of funding.

In 2012, a "Legislative Evaluation and Accountability Program" (LEAP) proviso from the WA State Legislature directed WSDOT to "complete the right of way plan and evaluation of NEPA for the project," and provided 3 million dollars in funding. WSDOT began work on the NEPA Re-evaluation in mid-2015 and continued in 2016. The Re-evaluation was necessary given more than three years had elapsed without action on the project since completion of the 2006 FEIS, to address regulatory changes, the extensive development which had occurred within the corridor since the 2007 ROD, and the refined alignment mentioned above.

In July 2015 the "Connecting Washington" transportation act was passed providing partial funding for the Puget Sound Gateway Program, including the Phase 1 Improvements of the SR 167 Completion Project. In January 2016, a WSDOT Puget Sound Gateway Program executive decision was made to delay the NEPA Re-evaluation until completion of WSDOT's Practical Solutions approach and further stakeholder involvement. WSDOT's Practical Solutions design approach allowed for a fresh look at the previous project plans to ensure that the revised project's design is focused on solutions that address the needs of the project. A large part of the Practical Solutions approach included re-engaging stakeholders to guide them through this new approach and allow them to weigh-in on the potential design changes while ensuring the essential needs of the project were still met.

DESCRIPTION OF CHANGED CONDITIONS: (See Attachment 1 for more detailed description).

The 2007 SR 167 Project ROD selected the Preferred "Build Alternative" which included a six-lane extension of SR 167 (four GP lanes and two HOV lanes) in each direction from its current terminus in Puyallup at SR 161 to I-5, a four-lane extension (two GP lanes) in each direction from I-5 to 54th Avenue East in Fife, and a single lane in each direction with direct connection to SR 509 near the Port of Tacoma. New interchanges were proposed at SR 161 (Meridian), Valley Avenue, a system level interchange at I-5 including direct connection HOV ramps, 54th Avenue East, and direct connection to SR 509.

The Phase 1 Improvements are essentially a subset of the improvements that were proposed in the 2006 FEIS (Exhibits 3.3-1 and 3.3-4 in the attached Re-evaluation). The Phase 1 Improvements would include four tolled GP lanes on the SR 167 extension (compared to six lanes as analyzed in the 2006 FEIS) from SR 161 in Puyallup to I-5, four tolled GP lanes on the SR 509 Spur from I-5 to 54th Avenue East, and a single lane (each direction) connection to SR 509. Interchange improvements would include a full single point urban interchange (SPUI) at SR 161, a ½ diamond interchange to the north at Valley Avenue, and a Diverging Diamond Interchange (DDI) at I-5, a ½ SPUI at 54th Avenue, and an at-grade direct connection at SR 509. The Phase 1 Improvements also assume that the SR 167 extension and the SR 509 Spur would be fully tolled. One toll point would be located on SR 167 between I-5 and the proposed Valley Avenue interchange, the other toll point would be located on the SR 509 Spur between I-5 and the proposed 54th Avenue interchange.

HAVE ANY NEW OR REVISED LAWS OR REGULATIONS BEEN ISSUED SINCE APPROVAL OF THE LAST ENVIRONMENTAL DOCUMENT THAT AFFECT THIS PROJECT?

YES (X) NO ( ) (If yes explain, use additional sheets if necessary)

- Under authority of the Clean Air Act, the US EPA has identified several pollutants as pollutants of concern nationwide and has established the National Ambient Air Quality Standards (NAAQS). These "criteria pollutants" include carbon monoxide, particulate matter (PM2.5 and PM10), ozone, sulfur dioxide, nitrogen dioxide, and lead. At the time of the 2006 FEIS, the project area was designated as a "maintenance area" for ozone and carbon monoxide, and "in attainment" for all other criteria pollutants. In 2009 the US EPA classified the Tacoma-Pierce County area as a "nonattainment area" because fine particulate (PM2.5) pollution exceeded air quality standards from 2006 to 2008. In February 2015, EPA re-designated the area to "attainment" and approved revision to the State Implementation Plan (SIP) and associated maintenance plan. The project area is currently designated as a maintenance area for both PM2.5 and PM10, which required an interagency coordination process to determine whether the SR 167 project was a "project of air quality concern." The interagency partners (EPA, FHWA, PSRC, PSCAA, FTA, and Ecology) consulted in December 2017, and concurred in March 2018 that the project is not one of air quality concern, therefore no hot-spot analysis was required. It is now common for all WSDOT projects in the Puget Sound region to rely on the PSRC regional model. A project-level regional analysis was conducted to estimate the SR 167 Completion Project's impact on regional air quality levels in King and Pierce Counties. The US EPA also regulates mobile source air toxics (MSATs). A qualitative analysis was completed for the 2006 FEIS as no regional emissions were quantified at that time. Using FHWA's *Updated Interim Guidance on Mobile Source Air Toxics Analysis in NEPA Documents* (FHWA 2016), the SR 167 Completion Project qualified as one having low potential MSAT effects. For these projects, a qualitative assessment of emissions projections is recommended, however, because a regional analysis for criteria pollutants was being conducted, WSDOT decided to complete a quantitative regional MSAT analysis as well.

- The evaluation of noise abatement for feasibility and reasonableness conducted for the 2006 FEIS has been updated using the current 2012 WSDOT Noise Policy criteria. The Phase 1 Improvements noise abatement analysis evaluates nine noise wall locations, including new walls. The findings from this analysis are shown in Exhibits 4.7-6 and 4.7-7 in the attached Re-evaluation and detailed in the Noise technical memorandum.

- The stormwater treatment facilities for the Phase 1 Improvements differ from those assumed in the 2006 FEIS because treatment facilities are designed using WSDOT's current Highway Runoff Manual (HRM) which was updated in 2016.

- Since the 2006 FEIS, the Cities of Tacoma, Fife, Milton, Edgewood, and Puyallup have updated their Critical Area Ordinances. Wetland buffer requirements under the cities' new ordinances (as applicable), and under the existing ordinance for Pierce County have been considered as part of the Re-evaluation.

- A new evaluation was conducted and Endangered Species Act (ESA) documentation prepared regarding potential impacts of the project on updated listed species under USFWS and NMFS jurisdiction that may occur in the action area. Changes since 2006 include listing of Chinook Salmon Critical Habitat and Bull Trout Critical Habitat as "Threatened" (versus Proposed), however the updated analysis concluded that the Phase 1 Improvements would not change the effect determinations for any of the listed species or critical habitat.

Species/Habitat	Federal Status (2006 FEIS)	Effect Determination	Federal Status (2018 Phase 1 Improvements)	Effect Determination
Bald Eagle	Threatened	NLTAA	Removed from ESA Listing	N/A
Marsh Sandwort	Endangered	NE	Endangered	NE
Golden Paintbrush	Threatened	NE	Threatened	NE
Water Howellia	Threatened	NE	Threatened	NE
Chinook salmon	Threatened	LTAA	Threatened	LTAA
Chinook salmon critical habitat	Proposed	LTAA	Threatened	LTAA
Bull Trout	Threatened	LTAA	Threatened	LTAA
Bull Trout critical habitat	Proposed	LTAA	Threatened	LTAA

NE = No Effect; LTAA = Likely to Adversely Affect; NLTAA = Not Likely to Adversely Affect; N/A = Not Applicable

- The local comprehensive plans and policies that were discussed in the 2006 FEIS have also been updated. Similar to findings in the 2006 FEIS, the current comprehensive plans for the cities of Tacoma, Fife, Milton, Edgewood, and Puyallup, as well as the Port of Tacoma recognize the project as a key element in the transportation system and contain a number of goals and policies of relevance to the Phase 1 Improvements. The plans advocate for completion of the SR 167 extension to increase accessibility to the regional transportation system. The SR 167 extension is also a key element of the City of Fife's long-range transportation system, and the Port of Tacoma continues to endorse and identify the project as the highest priority regional project in the Tideflats Area Transportation Study (TATS, 2011) final report.

- The Puget Sound Regional Council's (PSRC) VISION 2040 was adopted in 2008 and serves as PSRC's integrated long-range growth management strategy. It builds on the VISION 2020 plan, and Destination 2030 Metropolitan Transportation Plan referred to in the 2006 FEIS. Transportation 2040 is the transportation element of VISION 2040, the growth management, environmental, economic, and transportation strategy for the Central Puget Sound region. Transportation 2040 states that completing "key roadway projects that would enhance freight mobility, such as …SR 167 extension …" would be important for the region. This acknowledgement is similar to, but more specific than, what was included in the Destination 2030 MTP that was described in the 2006 FEIS.

- Since 2006, the FHWA guidance for conducting environmental justice has been refined. Current guidance recommends that the use of thresholds to identify environmental justice communities be avoided. The guidance recommends that a demographic analysis be conducted of affected communities first and then consideration of project impacts be given to low-income, minority or limited English speaking populations. The potential for disproportionately high and adverse effects, not the population size, should be the basis for environmental justice.

WILL THE CHANGED CONDITIONS AFFECT THE FOLLOWING DIFFERENTLY THAN DESCRIBED IN THE ORIGINAL ENVIRONMENTAL DOCUMENT? (If yes, attach a detailed summary addressing the impacts and mitigation)

	YES	NO		YES	NO
1) THREATENED or ENDANGERED SPECIES	( )	(X)	5) HAZARDOUS WASTE SITES	( )	(X)
2) PRIME and UNIQUE FARMLAND	( )	(X)	6) HISTORIC or ARCHAEOLOGICAL SITES	( )	(X)
3) WETLANDS	( )	(X)	7) 4 (f) LANDS	( )	(X)
4) FLOODPLAINS	( )	(X)	8) 6 (f) LANDS	( )	(X)

Effects on all resources will be the same or less than disclosed (documented) in the 2006 FEIS. See Attachment 1.

WILL THESE CHANGES RESULT IN ANY CONTROVERSY? YES () NO (X) (If yes explain)

WILL THESE CHANGES CAUSE ADVERSE IMPACTS IN THE FOLLOWING AREAS: (If yes, address comments below.)

	YES	NO		YES	NO
1) AIR QUALITY	( )	(X)	7) WATER QUALITY	( )	(X)
2) NOISE	( )	(X)	8) VISUAL QUALITY	( )	(X)
3) LAND USE	( )	(X)	9) NATURAL RESOURCES and ENERGY	( )	(X)
4) TRAFFIC or TRANSPORTATION	( )	(X)	10) PUBLIC SERVICES and UTILITIES	( )	(X)
5) DISPLACEMENT	( )	(X)	11) VEGETATION and WILDLIFE	( )	(X)
(business or residence)			12) RECREATION	( )	(X)
6) ECONOMIC GROWTH and DEVELOPMENT	( )	(X)	13) SOCIAL IMPACTS	( )	(X)

COMMENTS:

The refinements and updates addressed by the Re-evaluation do not substantially change the overall impacts that were discussed in the previously prepared project documents listed at the top of this form. None of the previously identified environmental commitments would change as a result of the design refinements identified.

CONCLUSIONS and/ or RECOMMENDATIONS:

Changes as noted above would not result in new significant adverse effects. Phase 1 of the SR 167 Completion Project remains compliant with current federal, state, local, and departmental regulations and directives with regard to National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA) processes. This Re-evaluation document, along with the supporting information, demonstrates that there would be no new significant adverse effects resulting from these changes as compared to the Final EIS that was approved in November 2006 and the ROD that was approved in October 2007.

I concur with the conclusions and recommendations above

WSDOT Official

Megan White, P.E.
Environmental Services Office Director

12/20/2018
Date

FHWA Official

Dean Moberg, P.E.
Area Engineer

20 December, 2018
Date

Attachment to the NEPA/SEPA Environmental Re-evaluation Form

PUGET SOUND GATEWAY PROGRAM – PHASE 1 OF THE SR 167 COMPLETION PROJECT

Environmental Re-evaluation

Prepared for
Federal Highway Administration
Washington State Department of Transportation

Prepared by
SR 167 Project Team

December 2018



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Attachment B Environmental Justice Discipline Report
Attachment C Water Resources Technical Memorandum
Attachment D Wetlands Technical Memorandum
Attachment E Wildlife, Fish, Vegetation, and Threatened and Endangered Species Technical Memorandum
Attachment F Air Quality Technical Memorandum
Attachment G Noise Technical Memorandum
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Attachment R Indirect and Cumulative Effects Technical Memorandum
Attachment S Section 4(f) Evaluation

Acronyms and Abbreviations

ACM	Asbestos Containing Materials
ADT	average daily traffic
AM	morning (AM) peak hour
APE	Area of Potential Effect
BA	Biological Assessment
BMP	best management practice
CFR	Code of Federal Regulations
CO	carbon monoxide
CO2	carbon dioxide
CO2e	carbon dioxide equivalent
DAHP	Washington State Department of Archaeology and Historic Preservation
dBA	A-weighted decibels
DBH	diameter breast height
DEIS	Draft Environmental Impact Statement
DTA	dynamic traffic assignment
EB	eastbound
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
GP	general purpose
GMA	Growth Management Act
HOV	high-occupancy vehicle
HRM	WSDOT Highway Runoff Manual
I-5	Interstate 5
LBP	lead based paint
Leq	equivalent continuous noise level
Leq(h)	Leq over an hourly interval

LOS	level of service
MP	milepost
MPH	miles per hour
MSAT	mobile source air toxics
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NB	northbound
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOx	nitrogen oxides
NRHP	National Register of Historic Places
PEM	palustrine emergent
PFO	palustrine forested
PGIS	pollutant-generating impervious surface
PM	afternoon (PM) peak hour
PM10	particulate matter 10 micrometers or less in diameter
PM2.5	particulate matter 2.5 micrometers or less in diameter
PSCAA	Puget Sound Clean Air Agency
PSRC	Puget Sound Regional Council
PSS	palustrine scrub-shrub
PUS	palustrine unconsolidated shore
RCW	Revised Code of Washington
ROD	Record of Decision
ROW	right-of-way
SB	southbound
SEPA	State Environmental Policy Act
SIP	State Implementation Plan
SPCCP	Spill Prevention Control and Countermeasures Plan
SPUI	single-point urban interchange
SR	State Route

SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TIP	Transportation Improvement Plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VMT	vehicle miles traveled
WB	westbound
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission

1. INTRODUCTION

The purpose of this National Environmental Policy Act (NEPA)/State Environmental Policy Act (SEPA) Environmental Re-evaluation (Re-evaluation) is to determine whether the first phase of the State Route 167 Completion Project (Phase 1 Improvements) would result in any new significant environmental impacts that were not previously evaluated in the SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation (2006 FEIS) and Record of Decision (2007 ROD). With the passing of the Connecting Washington Transportation Package in 2015 by the state Legislature, funding was made available for the first phase of the SR 167 Completion Project to proceed through environmental review, design, and into construction. The Phase 1 Improvements include approximately 4 miles of new limited-access highway with four general purpose (GP) lanes on the new SR 167 extension (compared to six lanes as analyzed in the 2006 FEIS) from its current terminus in Puyallup at State Route (SR) 161 to Interstate 5 (I-5), and a new approximate 2-mile "SR 509 Spur" highway section from SR 509 near the Port of Tacoma to the I-5/SR 167 interchange near 70th Avenue E.

The Phase 1 Improvements assume that all lanes will be tolled using two electronic toll points. One toll point will be located on SR 167 between I-5 and the proposed Valley Avenue interchange; the other toll point will be located on the SR 509 Spur between I-5 and the proposed 54th Avenue interchange. Both toll points will be located such that any user of the new Phase 1 Improvements will be charged a toll. The effects related to tolling (which were not previously evaluated) are a key consideration in the Re-evaluation, particularly as it relates to transportation and environmental justice effects. Before tolling can begin, a toll authorization bill must be passed by the Legislature. The rate-setting process will be overseen by the Washington State Transportation Committee (WSTC) in advance of completion of the Phase 1 Improvements.

The SR 167 Completion Project is based on nearly three decades of project planning and development. In 1993, the Washington State Department of Transportation (WSDOT) released the SR 167 Corridor Adoption Puyallup to SR 509 Tier I Draft Environmental Impact Statement (DEIS), which identified and analyzed significant impacts along several proposed corridors, and a preferred corridor. Within the selected SR 167 corridor, a No Build Alternative and a Build Alternative mainline alignment identified in the Tier I FEIS with various interchange options were evaluated in a project level Tier II Draft Environmental Impact Statement (EIS), published in 2003. The Tier II FEIS and Section 4(f) Evaluation issued in November 2006 and ROD in October 2007 identified the Preferred Build Alternative. The 2006 Build Alternative included approximately 6 miles of divided highway, including four GP lanes (two lanes in each direction) and one high occupancy vehicle (HOV) lane in each direction between SR 161 and I-5, four lanes (two lanes in each direction) from I-5 to 54th Avenue E, and a single lane in each direction from 54th Avenue E to SR 509. It also included interchange connections at SR 161 (Meridian), Valley Avenue, a system level interchange at I-5 with direct-connect HOV ramps, 54th Avenue E, and direct connection to SR 509.

Since the ROD was issued in 2007, project progress has included actions such as the purchase of needed right-of-way (ROW), construction of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. In addition, WSDOT undertook a Practical Solutions design approach, which allowed a fresh look at the previous project plans to ensure that the revised project is designed according to actual demand and needs. Part of the Practical Solutions approach included re-engaging stakeholders to review design and potential changes.

2. RE-EVALUATION PROCESS

This Re-evaluation has been prepared to identify and document changed environmental conditions and effects associated with the Phase 1 Improvements (23 Code of Federal Regulations [CFR] Part 771.129). The Re-evaluation examines the Phase 1 Improvements to determine if the resultant impacts (beneficial and/or adverse) present any new significant environmental impacts from what was previously documented in the ROD issued by the Federal Highway Administration (FHWA) in 2007. Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to the natural and built environments.

This Re-evaluation summarizes the changes to the affected environment since the 2006 FEIS was released, discusses how the Phase 1 Improvements would affect the natural and built environments in the project study area, and compares those effects with the effects of the Build Alternative as analyzed in the 2006 FEIS. Resource areas were re-analyzed in a series of separate discipline reports and technical memoranda, which are presented in Attachments A through S. The Re-evaluation makes many references to the 2006 FEIS, including the maps and mitigation measures that are still relevant to the updated analyses. The 2006 FEIS can be found on WSDOT's website at https://www.wsdot.wa.gov/Projects/SR167/completion/Publications.htm.

This document has been completed in accordance with NEPA; the Council on Environmental Quality's regulations implementing NEPA (40 CFR Parts 1500-1508); the FHWA's regulations for Environmental Impact and Related Procedures (23 CFR Part 771); Section 4(f) of the Department of Transportation Act (49 United States Code U.S.C. § 303); the FHWA's regulations implementing Section 4(f) (23 CFR Part 774); the FHWA's NEPA and Transportation Decision-making (FHWA 1992); and Chapter 400.06 (1), Re-evaluations, of the Washington State Department of Transportation (WSDOT) Environmental Manual M 31-11.13 (WSDOT 2018)

3. PROJECT DESCRIPTION

3.1 Purpose and Need

The purpose and need of the proposed action is the same as described in the 2006 FEIS. The purpose of the proposed action is to improve regional highway connections with an extension of SR 167 to serve current and future transportation needs in northern Pierce County and to enhance regional freight mobility and access to the Port of Tacoma. The project area vicinity map is shown in Exhibit 3.2-1.

The proposed project is needed to create system linkages, accommodate travel demand and capacity needs, and improve intermodal relationships. The SR 167 freeway currently terminates in Puyallup at SR 161 (N Meridian Avenue) and does not connect to I-5 and the regional transportation highway system; this leaves a major gap in the system. As a result, local streets and major transportation routes are at or over capacity given current travel demand. This situation is expected to worsen as travel demand for the Port of Tacoma and major roadways increases.

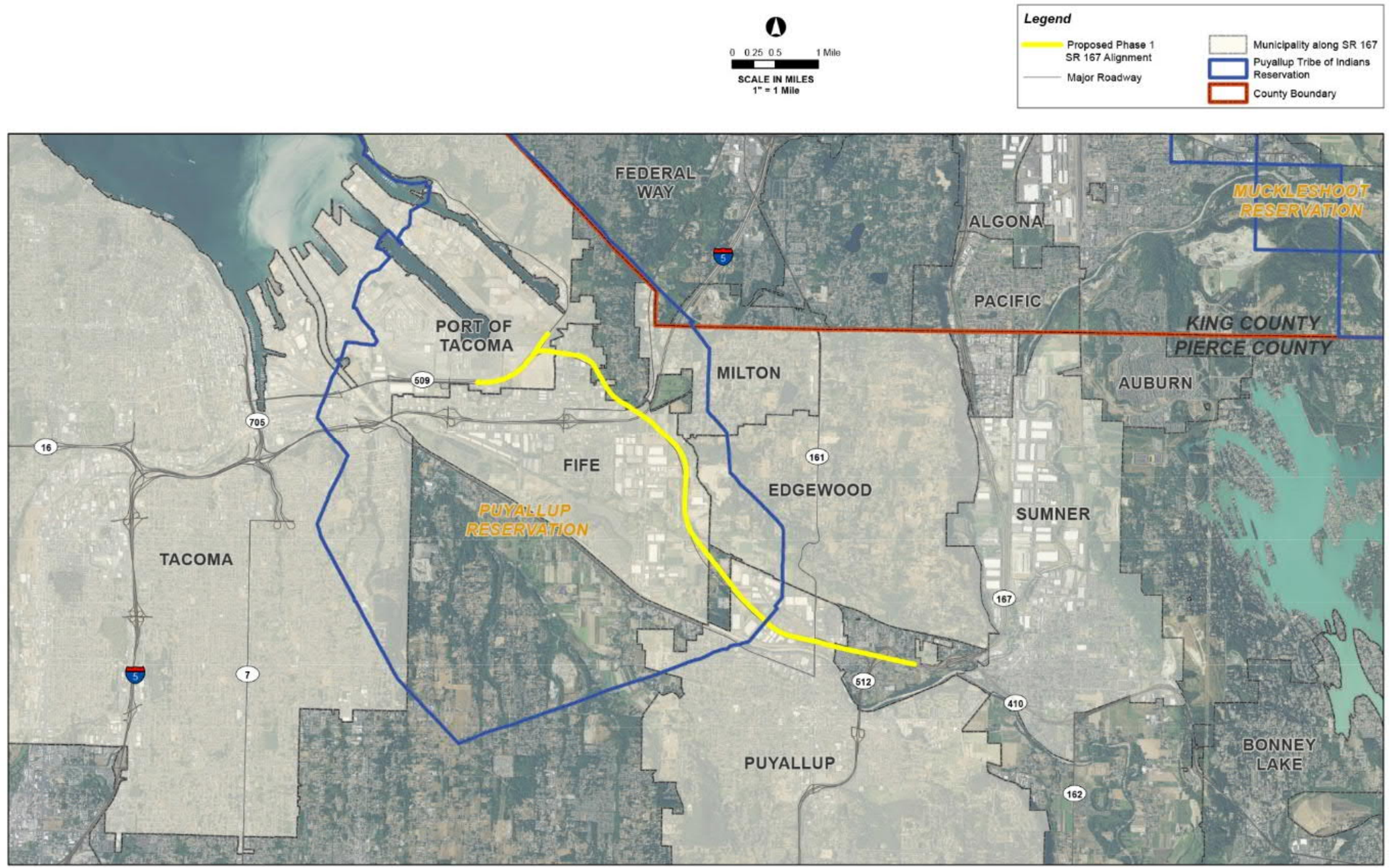
3.2 2006 FEIS Preferred Build Alternative

A detailed description of the 2006 Build Alternative was provided in Section 2.5.2 of the 2006 FEIS. In summary, the Build Alternative included approximately six miles of new divided highway, including four GP lanes (two lanes in each direction) and one HOV lane in each direction between SR 161 and I-5, four lanes (two lanes in each direction) from I-5 to 54th Avenue E, and a single lane in each direction from 54th Avenue E to SR 509. The Build Alternative included new interchange connections in five locations:

- SR 161 (N Meridian Avenue) in Puyallup
- Valley Avenue E in Fife
- A system level interchange at I-5 with direct-connect HOV ramps in Fife
- 54th Avenue E in Fife
- Direct connection to SR 509 in Tacoma

The 2006 Build Alternative also included two new park-and-ride lots and two new weigh stations.

Exhibit 3.2-1. SR 167 Completion Phase 1 Improvements Project Vicinity



3.3 Phase 1 of the SR 167 Completion Project (Phase 1 Improvements)

The Phase 1 Improvements are a subset of the improvements that were proposed in the 2006 FEIS, on a slightly refined alignment. In summary, the Phase 1 Improvements would complete the SR 167 freeway by building approximately 4 miles of a new limited-access facility with four GP lanes on a tolled facility (compared to six lanes on a nontolled facility as analyzed in the 2006 FEIS) from SR 161 in Puyallup through the Puyallup River Valley to I-5. The project also would add 2 miles of tolled highway from SR 509 near the Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue.

The new limited access freeway segments would include interchange improvements at five locations (consistent with the 2006 FEIS):

- SR 161 (N Meridian Avenue) in Puyallup
- Valley Avenue E in Fife
- A Diverging Diamond Interchange (DDI) in Fife
- 54th Avenue E in Fife
- SR 509 in Tacoma

The Phase 1 Improvements would not include the two park-and-ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative. The project components as analyzed in the 2006 FEIS are compared to the Phase 1 Improvements in Exhibit 3.3-1 and shown in Exhibit 3.3-2, Exhibit 3.3-3, and Exhibit 3.3-4.

This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements. The Phase 1 Improvements do not preclude the construction and environmental reviews of future phase(s) to achieve the remaining design elements within the ROD. At this time, there is no Legislative direction and funding availability for the implementation of future phase(s).

Exhibit 3.3-1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Avenue	Direct connection, single lane in each direction, at grade connection east of Alexander Avenue
54th Avenue E interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 interchange	System level interchange, including Direct-connect HOV ramps	Diverging Diamond Interchange. No Direct-connect HOV ramps.
SR 167 I-5 to Valley Avenue E	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue E interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond interchange to the North
SR 167 Valley Avenue E to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed

Exhibit 3.3-1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 161 interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue E Connector	Yes	No
70th Avenue E Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Tolling	None	2 GP lanes in each direction
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue E
SR 161 and Valley Avenue E Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

Exhibit 3.3-2. Design Components of 2006 FEIS Build Alternative

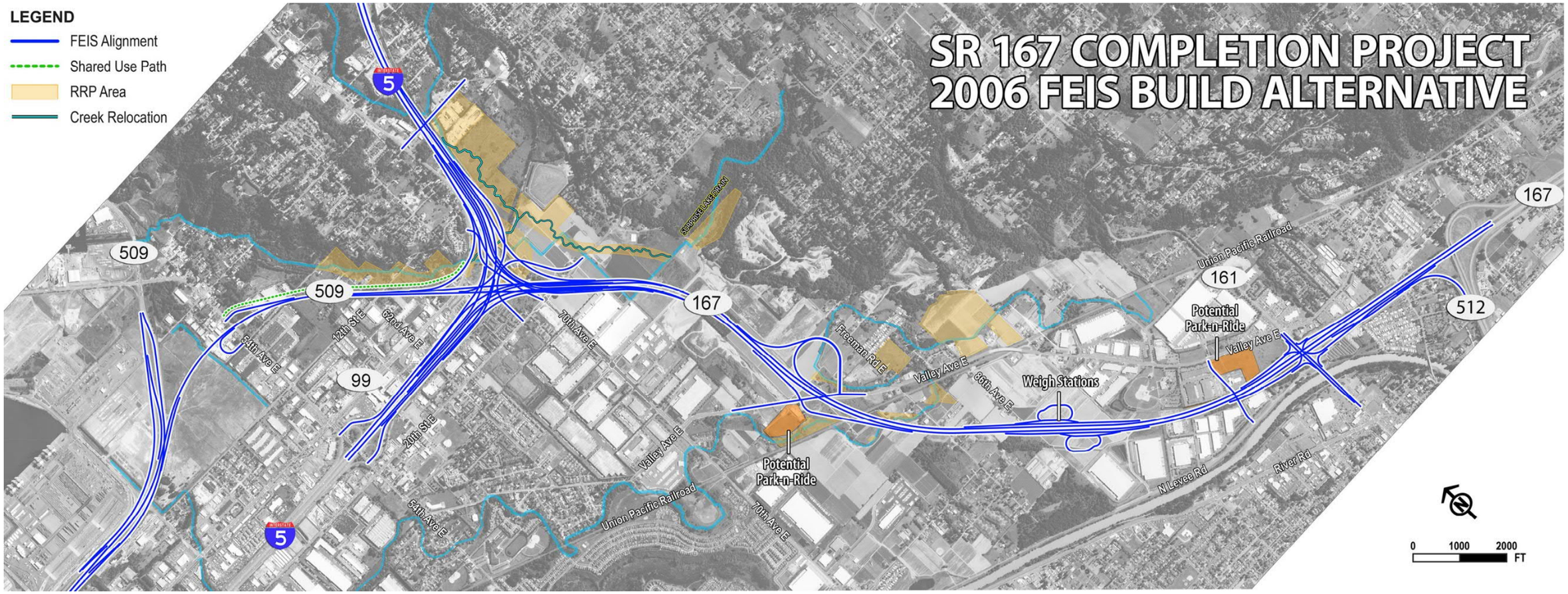


Exhibit 3.3-3. Design Components of 2018 SR 167 Completion Project Phase 1 Improvements

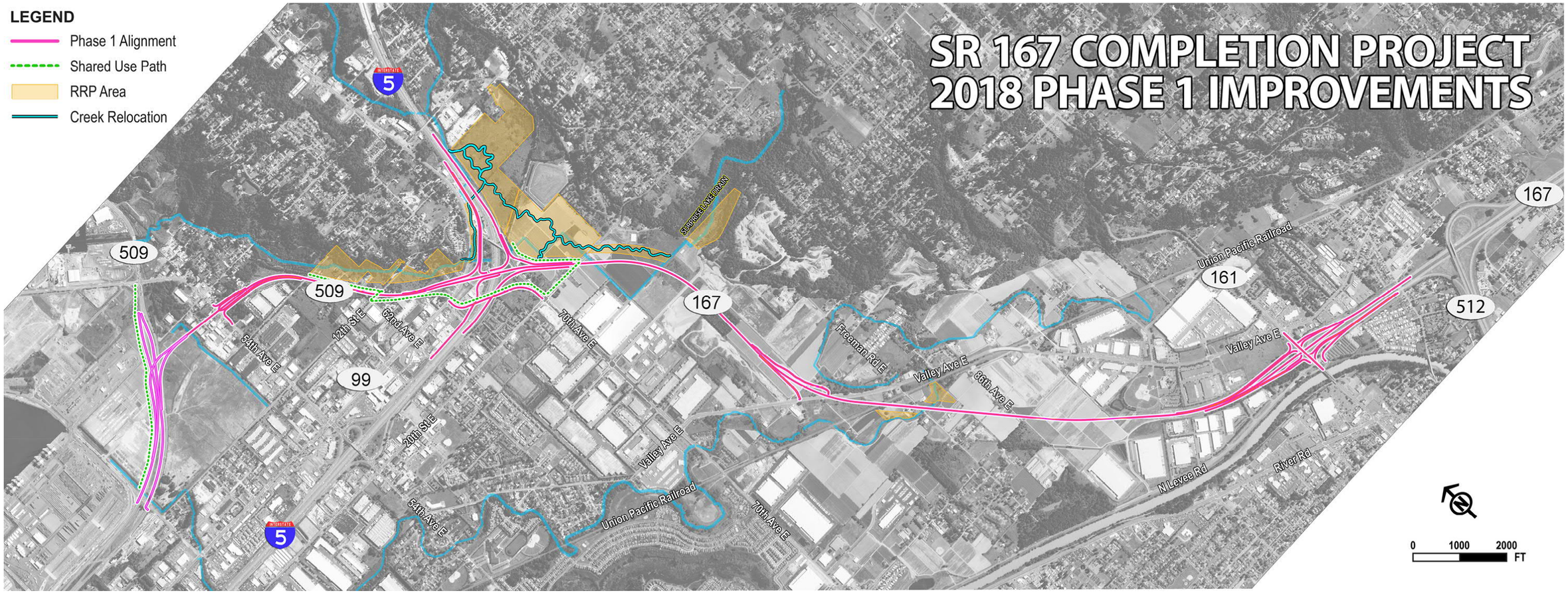
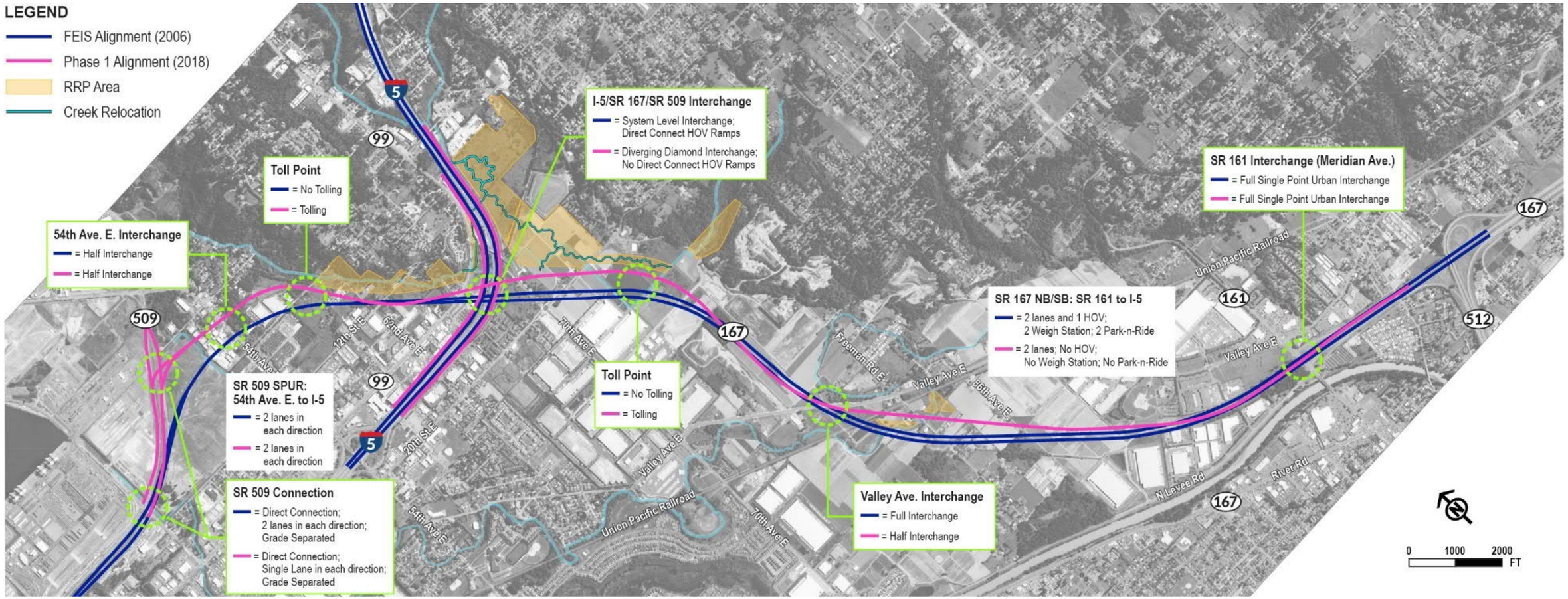


Exhibit 3.3-4. Overlay Comparison of 2006 FEIS and 2018 SR 167 Completion Project Phase 1 Improvements



4. DESCRIPTION OF CHANGED CONDITIONS AND EFFECTS

This section describes the changes to the affected environment since the 2006 FEIS was released, discusses how the Phase 1 Improvements would affect the natural and built environments in the project study area, and compares those effects with the effects of preferred Build Alternative analyzed in the 2006 FEIS. The analysis was conducted using current information, including new guidelines or regulations where applicable, and compares the changes and effects between the project footprint described in the 2006 FEIS to the current footprint for the Phase 1 Improvements (Exhibit 3.2-1). Since the 2006 FEIS, toll revenue bonds have also been identified as a means to finance the SR 167 Completion Project. The potential toll adjustments would not change the study limits; therefore, they would not affect physical conditions, property requirements, or natural resources in the study area (i.e., community character, parklands and recreational resources, visual and aesthetic conditions, historic and cultural resources, noise, energy and climate change, topography, geology and soils, water quality, ecology, hazardous materials, or construction impacts).

The effects related to tolling, however, are a key consideration in the transportation analysis and environmental justice analysis. An updated transportation analysis that assumed tolling was conducted for this Re-evaluation using 2015 existing traffic data and horizon year 2045 traffic projections. The 2006 FEIS presented 2000 existing traffic data and horizon year 2020 traffic projections and did not address tolling. Potential economic effects on low-income and minority households and overall freeway travelers were also examined. Sections 4.1, Transportation; 4.2, Environmental Justice; and 4.18, Indirect and Cumulative Effects summarize the effects related to tolling. Transportation and environmental justice effects are also detailed in separate discipline reports that are provided in Attachments A and B.

4.1 Transportation

The 2006 FEIS presented year 2000 existing conditions and a horizon year of 2030 for the No Build and Build conditions. While AM and PM operations on I-5 were discussed in the 2006 FEIS, only PM peak hour conditions were reported for local roadway intersection operations. Since the 2006 FEIS was based on year 2000 conditions, it was determined that it was necessary to update existing conditions to more current conditions because existing conditions in the project area have changed substantially. For example, peak period speeds on I-5 through the study area are notably lower in the peak directions now than what was presented in the 2006 FEIS (AM northbound [47 mph in 2016 – compared to 65 mph in 2000 from 2006 FEIS] and PM southbound [40 mph in 2016 – compared to 60 mph in 2006 FEIS]). Also, the 2006 FEIS did not report existing year peak hour volumes, only average daily traffic (ADT) volumes. For comparison purposes, 2016 ADT volumes are 18 to 14 percent higher than the reported 2000 ADT volumes listed in the 2006 FEIS.

The methodology and assumptions used to analyze the existing and future traffic conditions have also been updated since the 2006 FEIS. Several advancements in travel demand forecasting and traffic analysis have been made since the work completed in 2006. While current travel demand forecasting techniques continue to follow a similar four-step process as used in the past—including trip generation, distribution, mode choice and assignment—the discrete steps have seen advancements in data supply and competency. Trip generation information is continuously updated and travel demand and traffic assignment models today have been refined to reflect changes in trip generation rates, linking of trips, time distribution of trips, and activity generation centers. Trip distribution is also significantly improved in current models as minor arterials and streets are better represented in the models as well as the volume, speed, and delay functions. Mode choice models and the ability to better model bus transit, carpools, vanpools, and light rail transit are present with current tools. The traffic analysis results in this report are based on travel forecasts that have been developed with these updated modeling tools.

Operational analysis tools have also seen significant improvements in technology approaches and robustness. The 2006 analysis was based on an older version of the Highway Capacity Manual procedures. These procedures have seen multiple updates in analysis methodology and underlying speed-flow curves. At the time of the 2006 analysis, dynamic traffic assignment (DTA) tools were not available because the technology and software packages did not exist. The current simulation-based DTA model tools, e.g., Dynameq by INRO, blend traffic assignment capabilities with the intersection/link operational analysis characteristics of traffic simulation tools; hence, they provide more accurate traffic forecast assignments. Additionally, these tools are better able to reflect the presence of pricing or tolling and the associated choices and alternatives drivers have for either using or avoiding toll facilities.

This analysis presents 2016 existing conditions and a horizon year of 2045 (approximately 20 years beyond the anticipated opening of Phase 1- Stage 1) for No Build and Build conditions for AM and PM peak hour operations for both freeway and arterial intersection operations. Additionally, the 2006 FEIS Build Alternative did not include tolls on the project roadways, and used traditional travel modeling tools to assess expected roadway performance. The analysis assumes tolled roadways, and is based on results from a DTA model that more accurately assesses current and future freeway conditions compared to the 2006 analysis, particularly under congested conditions.

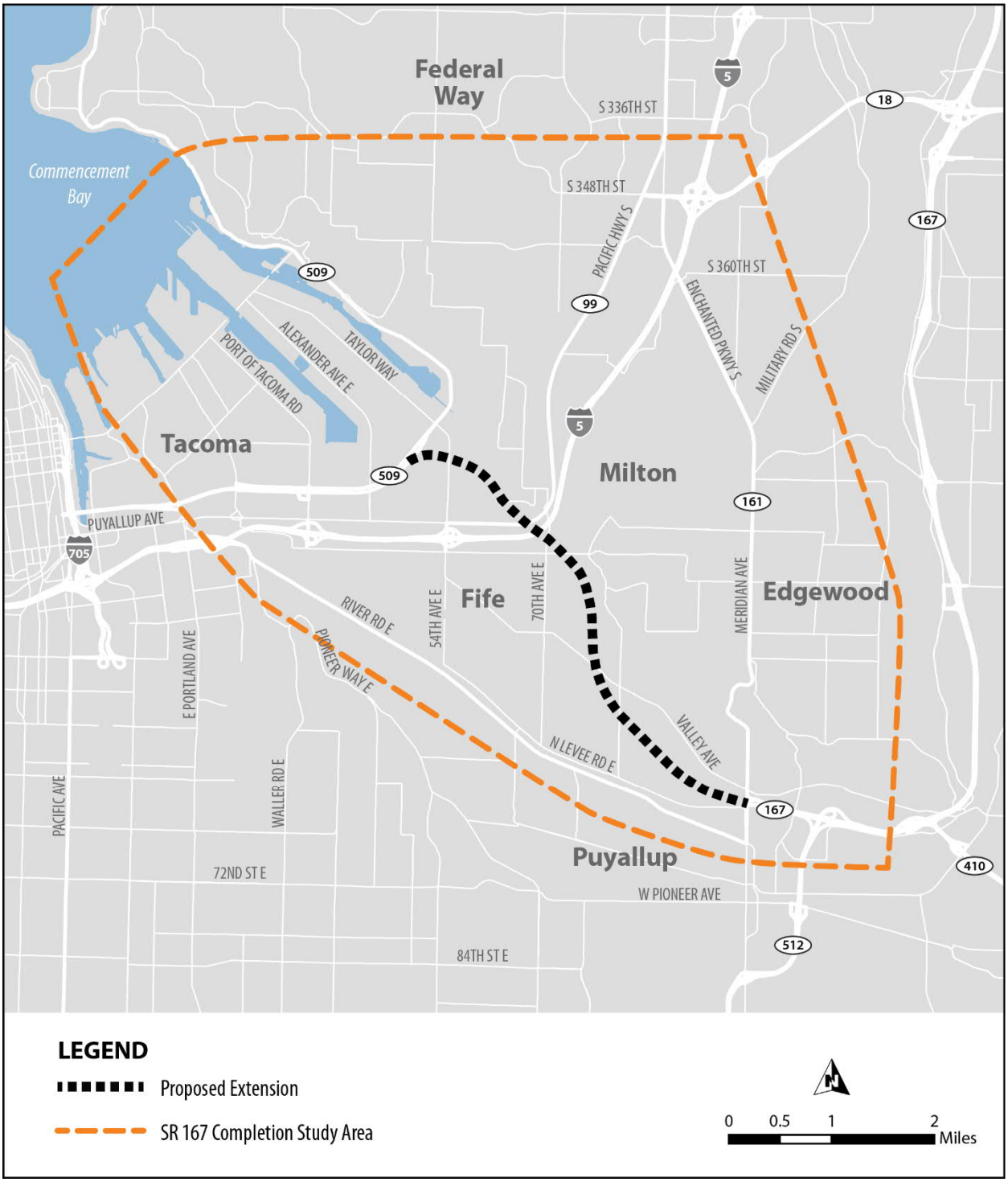
See also Attachment A, Transportation Discipline Report.

Affected Environment

The project's study area is the same as in the 2006 FEIS and is bounded by the proposed SR 509 Spur/SR 509 interchange to the west, the I-5/SR 18 interchange to the north, the existing SR 167/SR 410

interchange to the southeast, and the I-5/Port of Tacoma Road interchange to the southwest as shown in Exhibit 4.1-1.

Exhibit 4.1-1. SR 167 Completion Project Transportation Study Area



Existing (2016) Traffic Volumes

Selected AM and PM peak hour traffic volumes on the freeways and streets within the project area are listed in Exhibit 4.1-3 for the locations depicted on Exhibit 4.1-2. These volumes are based on traffic counts conducted by the jurisdiction operating the various facilities. Where year 2016 data were not available, the traffic volumes were estimated by applying growth factors to earlier counts.

Exhibit 4.1-2. Locations for Traffic Volume Measurement Points

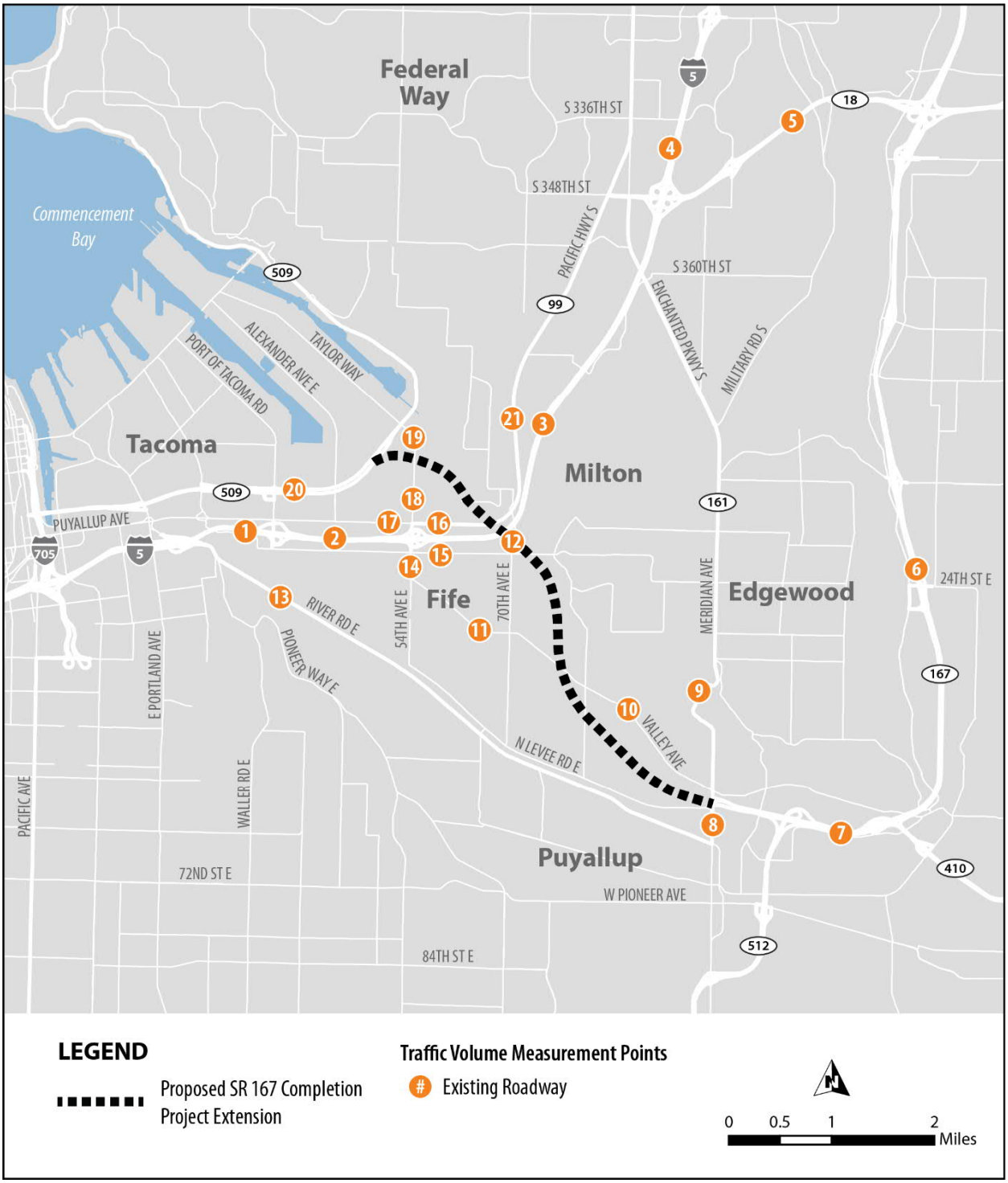


Exhibit 4.1-3. AM and PM Peak Hour Traffic Volumes in Project Area

Measurement Point	Location	AM Peak Hour (vehicles per hour)	PM Peak Hour (vehicles per hour)
1	I-5 south of Port of Tacoma Road	12,780	13,510
2	I-5 north of Port of Tacoma Road	12,610	11,490
3	I-5 north of the Fife Curve (south of SR 18)	11,630	10,990
4	I-5 north of SR 18	11,030	12,060
5	SR 18 west of Military Road	7,240	7,450
6	SR 167 north of 24th Street E	5,820	6,690
7	SR 167 north of SR 512	6,380	6,690
8	Meridian Avenue south of N Levee Road	2,370	3,250
9	SR 161 south of 43rd Street Ct E	640	400
10	Valley Avenue E east of Freeman Road	1,080	1,300
11	Valley Avenue E west of 70th Avenue	970	1,100
12	70th Avenue E north of 20th Street E	710	890
13	River Road (SR 167) east of 30th Avenue E	1,920	2,230
14	54th Avenue E south of 20th Street E	1,150	1,220
15	20th Street E east of 54th Avenue E	980	1,420
16	Pacific Highway (SR 99) east of 54th Avenue E	1,580	1,950
17	Pacific Highway (SR 99) west of 54th Avenue E	1,380	2,290
18	54th Avenue E north of Pacific Highway (SR 99)	930	1,090
19	Taylor Way east of SR 509	930	1,200
20	SR 509 east of Port of Tacoma Road	2,110	3,000
21	Pacific Highway (SR 99) north of Porter Way	1,430	2,190

Roadway Capacity

Most of the existing capacity restrictions are in the vicinity of principal arterial intersections or freeway interchanges. Freeway mainline and interchange operations, as well as key intersections on the surface street system are explained below.

Freeways

Peak Period Congestion and Queues

Congestion—due to the constraints of the Puyallup River Bridge, ongoing project construction in the corridor, as well as the merging and lane changing activity that occurs between the I-705 Portland Avenue and Port of Tacoma interchanges—lasts throughout the AM peak period, though it begins to subside somewhat after 8:00 a.m. Construction activities between SR 16 and the Puyallup River Bridge also adds to the current congestion in this stretch. A northbound HOV lane begins as an added lane to I-5 north of the Port of Tacoma Road interchange, which helps alleviate congestion. The other notable

morning slowdowns generally occur south of SR 18 between 6:30 and 8:00 a.m. and are likely due to high volumes exiting to SR 18 and Federal Way, which slows down the right mainline lanes.

PM peak period congestion in the peak direction is more substantial than AM peak period congestion and generally extends the length of the study corridor. Southbound congestion typically emanates from the Port of Tacoma Road and 54th Avenue interchange areas south of the "Fife curve"[1] and stretches back to the SR 18 interchange area, with the heaviest congestion occurring between 4:00 and 6:00 p.m. The southbound I-5 mainline also reduces from a five-lane to a four-lane cross-section at the 54th Avenue interchange, which constrains the capacity of the mainline and contributes to congestion.

Peak Period Average Speeds

Peak period average speeds on I-5 through the study area and SR 167 between Meridian Avenue and SR 410 are shown in Exhibit 4.1-4. Average speeds on I-5 are lower in the peak directions (AM northbound (47 miles per hour [mph]) and PM southbound (40 mph) than in the off-peak directions (AM southbound (greater than 55 mph) and PM northbound (52 mph). The southbound PM peak slowdowns are consistent with the speed temporal chart, which indicates a back-up emanating from the Port of Tacoma Road and 54th Avenue E interchanges.

Exhibit 4.1-4. Existing Peak Period Average Speeds from Dynameq Model (mph)

Roadway Segments	AM Peak Period (6:00-9:00 AM)		PM Peak Period (3:00-6:00 PM)	
	NB/EB	SB/WB	NB/EB	SB/WB
I-5 through study area (I 705 to SR 18)	47	55+	52	40
SR 167, SR 161 to SR 410	52	44	51	44

The Dynameq modeled speeds on I-5 are an average of both the general purpose and HOV lanes.

Average speeds on SR 167 are over 50 mph northbound in both the AM and PM peak periods as traffic transitions from an arterial environment to a freeway facility east of Meridian Avenue. However, the average speeds in the reverse direction are generally slower in both peak periods due to a combination of added traffic from SR 410 and SR 512, as well as the termination of the existing SR 167 freeway facility at Meridian Avenue.

Peak Period Travel Times

Existing peak period travel times are shown in Exhibit 4.1-5. Peak period travel times were calculated for selected trips between key regional centers and other representative origin\destination locations as indicated by the paths shown in Exhibit 4.1-6. Travel times along paths that use I-5 are typically longer in the peak direction (AM northbound and PM southbound) due to congested conditions.

1. Area east of 54th Avenue E. and 70th Avenue E where I-5 goes from an east-west to a north-south facility.

Exhibit 4.1-5. Existing Peak Period Travel Times from Dynameq Model (minutes)

Travel Paths		AM Peak Period (6:00-9:00 AM)		PM Peak Period (3:00-6:00 PM)	
ID #	Path Description	NB/EB	SB/WB	NB/EB	SB/WB
1	Through study area on I-5	11	8	10	12
2	Puyallup to north of SR 18	19	18	17	18
3	Port of Tacoma to Sumner/Pacific MIC	21	22	23	22
4	Port of Tacoma to SR 18	13	13	13	14
5	Port of Tacoma to Puyallup	17	17	21	18

Exhibit 4.1-6. Travel Time Paths Measured in Dynameq Model



Existing Intersection Level of Service

Surface Streets

Exhibit 4.1-7 lists existing (year 2016) AM and PM peak hour operations at 36 key intersections in the study area whose locations are shown in Exhibit 4.1-8. Existing traffic counts determined that the actual peak hour differed between intersection locations, but was generally around 7:00 to 8:00 a.m. for the morning peak, and 4:30 to 5:30 p.m. for the afternoon peak. The LOS threshold below which operations are not considered acceptable is LOS D for all of the jurisdictions in which these intersections are located.

As shown, the majority of the intersections are operating above the LOS standard (27 intersections during the AM peak hour and 24 intersections during the PM peak hour). In the AM peak hour, six intersections operate at the LOS standard and three intersections operate below the LOS standard.

Overall operations are generally worse in the PM peak hour, with four intersections operating at the LOS D standard and eight operating below the LOS standard.

Exhibit 4.1-7. Intersection Peak Hour Level-of-Service—Existing Conditions

Int. #	Location		Intersection Type	Existing Conditions	
				AM	PM
1	Port of Tacoma Rd	20th Ave	Stop-controlled	A	A
2	Port of Tacoma Rd	NB I-5 on/off ramp	Yield-controlled	A	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	B	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	E	F
5	Port of Tacoma Rd	NB SR 509/12th Street E	Signalized	B	B
6	Port of Tacoma Rd	N Frontage Rd (SB SR 509)	Signalized	B	B
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	B	B
8	Alexander Ave	NB SR 509	Signalized	C	C
9	Alexander Ave	SB SR 509	Signalized	C	F
10	54th Ave	Valley Ave	Signalized	B	A
11	54th Ave	23rd St	Signalized	A	A
12	54th Ave	20th St	Signalized	D	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	E	E
14	54th Ave	SB I-5 on/off ramp	Signalized	C	C
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	D	E
16	54th Ave	12th St	Signalized	A	A
17	54th Ave	8th St	Signalized	A	A
18	54th Ave	4th St	Stop-controlled	A	A
19	54th Ave	SR 509/Taylor Way	Signalized	D	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	C	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	D	C
22	70th Ave	20th Ave	Signalized	C	E
23	70th Ave	Valley Ave	Signalized	C	D
24	70th Ave	North Levee Rd	Stop-controlled	A	E
25	Pioneer Way	WB SR 512	Signalized	B	B
26	Pioneer Way	EB SR 512	Signalized	A	A
27	66th St	River Rd E (SR 167)	Signalized	F	E
28	66th St	North Levee Rd	Stop-controlled	D	B

Exhibit 4.1-7. Intersection Peak Hour Level-of-Service—Existing Conditions

Int. #	Location		Intersection Type	Existing Conditions	
				AM	PM
29	Freeman Rd	20th Ave/Yuma St	Signalized	B	C
30	Freeman Rd	Valley Ave	Signalized	B	C
31	82nd Ave	North Levee Rd	Stop-controlled	A	A
32	N Meridian Ave	River Rd E (SR 167)	Signalized	C	C
33	N Meridian Ave	4th Street NE	Stop-controlled	A	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	A	A
35	N Meridian Ave	SR 167	Signalized	D	D
36	N Meridian Ave	Valley Ave	Signalized	C	D

Yellow shading indicates intersection operates at LOS standard (LOS D), while red shading indicates intersection operates below LOS standard (LOS E or F).

Exhibit 4.1-8. Locations of Intersections Analyzed



Transportation Safety Performance

The SR 167 Corridor Adoption (Tier I) FEIS and SR 167 Puyallup to SR 509 Tier II FEIS accident data analysis reflected the safety performance conditions on the existing freeway and local street system. As identified in the previous efforts, severe congestion and inadequate intersection geometry on both networks contributed to areas with high accident rates. The primary focus of WSDOT's Target Zero campaign is on the reduction and elimination of fatal and serious injury crashes. A current safety performance assessment is documented below.

Crash Analysis

There is a fairly even distribution of crashes along the I-5 freeway segment through Fife, as well as distinct groupings of crashes at interchange areas such as I-5 at 54th Avenue E and on SR 167 at Meridian Avenue (SR 161) in Puyallup, as shown in Exhibit 4.1-9.

Crashes on I-5, SR 509, SR 167, and SR 161 were also categorized by year, type, and direction, as shown in Exhibit 4.1-10. The summaries indicate a large proportion of rear-end crashes on I-5, which is typical of highly congested freeway segments, especially during peak weekday traffic periods. In terms of year-over-year growth in total crashes, a clear upward trend in the data is observed for all facilities assessed, with the most extreme being the approximate doubling of total crashes on I-5 from 2012 to 2017. Based on the data, the number of crashes along the subject I-5 segment and the other state routes have been growing at a rate of 5 to 10 percent over the last several years.

Exhibit 4.1-9. Crash Data Cluster Plot

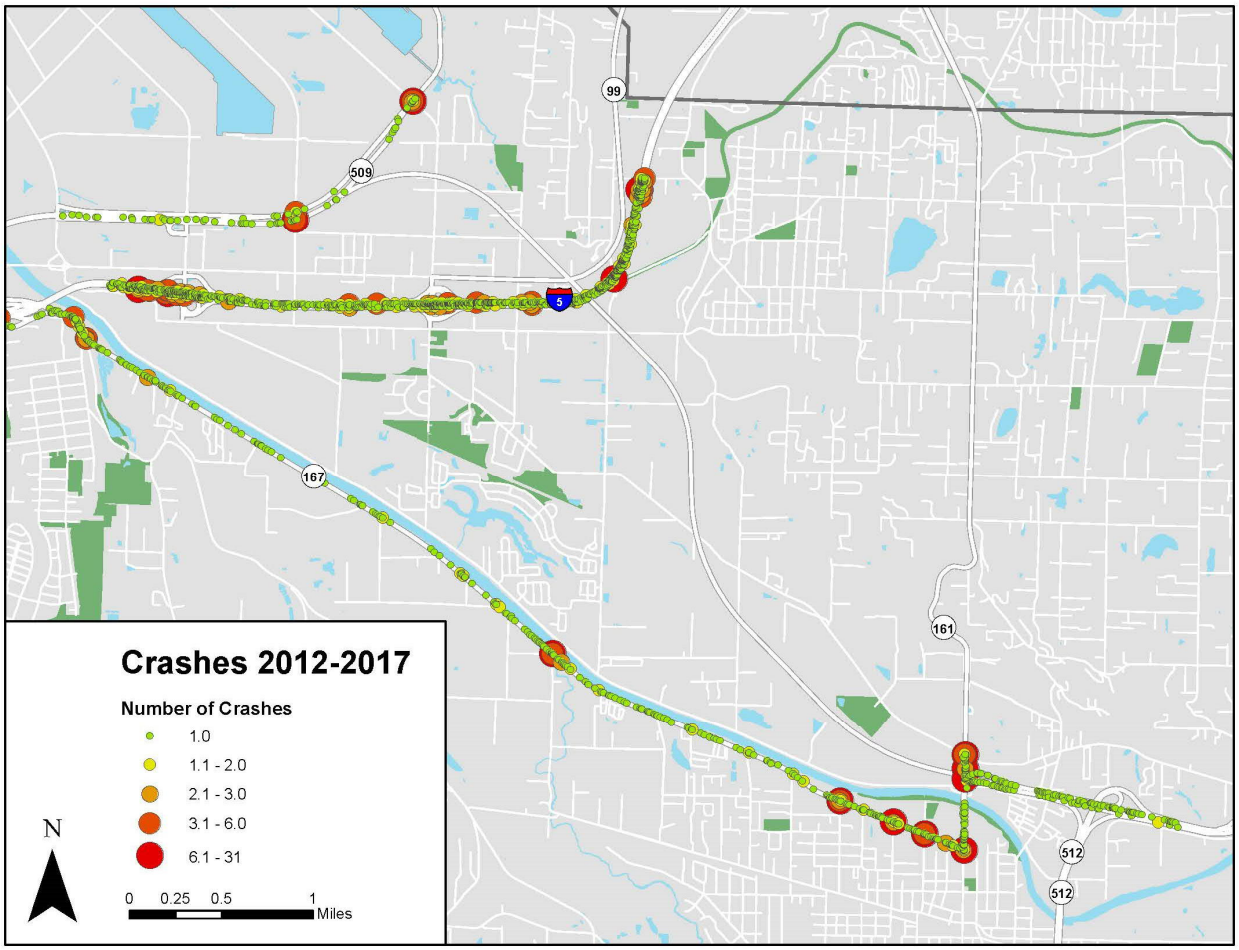


Exhibit 4.1-10. Crashes by Location, Year, and Type from 2012–2017

Crashes on I-5 Mainline (Fife) MP 135.69 to MP 139.06									
Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012–2017	10	4	201	924	331	12	1	105	1,574
Crashes on SR 509 Mainline MP 1.66 to MP 03.91									
Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012–2017	2	0	22	67	26	1	3	86	205
Crashes on SR 167 Mainline MP 5.26 to MP 6.44									
Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012–2017	7	2	26	273	73	5	45	113	535
Crashes on SR 167 (River Road) MP 0.59 to MP 6.22B									
Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012–2017	14	5	48	178	39	6	38	104	413
Crashes on SR 161 (Meridian Ave E) MP 29.87 to MP 30.04									
Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012–2017	1	0	2	46	43	1	6	28	126

Based on the crash data observations, the predominate accident types for each location is as follows:

- Along I-5 mainline, 59 percent of crashes are rear-end.
- Along SR 509, 42 percent of the accidents are "other."
- On the freeway portion of existing SR 167 investigated, 51 percent of crashes are rear-end.
- Along the short stretch of SR 161 for which data was collected, 37 percent of accidents were rear-end.
- On the River Road portion of existing SR 167 investigated, 43 percent of all crashes are rear-end.

The statewide accident rate (number of accidents per million vehicle miles) is 1.96 based on the 2015 Washington State Annual Collision Summary (WSDOT 1996). The 2012 to 2017 accident rate for I-5 mainline is 1.08 and for SR 509 is 1.18, which is below the statewide collision rate; whereas, the collision rates along SR 167 and SR 161 are 3.46 and 3.99 respectively, which are higher than Washington State's average collision rate. In the 2006 FEIS, collision rates on the River Road portion of SR 167 were recorded as between 1.67 and 2.75 crashes per million vehicle miles. The average collision rate for this section of roadway is 3.35 crashes per million vehicle miles from 2012 to 2017.

Heavy volumes of traffic, geometrics that do not meet current standards, and interchange-related congestion are the primary contributing factors to the accidents. The Phase 1 Improvements, along with WSDOT's Tacoma HOV program, will correct some of the geometric deficiencies and reduce interchange-related congestion on I-5. As for the congestion-related accidents, the proposed SR 167

project will provide relief with the addition of the SR 167/I-5 interchange and the SR 167/SR 161 interchange, and the reduction of traffic volumes from arterial roadways between Puyallup and I-5.

Port, Rail, and Transit Facilities

Major regional nonhighway transportation facilities and services exist within the project area. These facilities include the Port of Tacoma, railroad operations, and transit agencies providing local and regional services with bus and commuter rail lines.

Port of Tacoma

In 2015, the Port of Tacoma joined the Port of Seattle to form the Northwest Seaport Alliance in an effort to capitalize on the strengths of the individual ports and leverage strategic investments to compete more effectively with other national and international ports. Recent transportation projects completed in the Port of Tacoma area include the upgrading of Port of Tacoma Road to better accommodate heavy trucks and the installation of two 7,000-foot intermodal rail tracks in collaboration with Tacoma Rail. The Port of Tacoma is also involved in supporting a project to upgrade the I-5/Port of Tacoma Road interchange through financial and real-estate contributions.

In 2016, the Port of Tacoma processed a cargo volume of over 28 million metric tons[2] with the vast majority (over 90 percent) being container traffic. This volume of container traffic makes it one of the top container ports on the West Coast, serving as a transfer point between rail, truck, and ship for cargo to and from other ports on the Pacific Rim and domestic markets in the Northwest, Midwest, and East Coast. Container cargo with origins or destinations in the Northwest is typically moved to and from the port via truck, resulting in high number of container hauling truck trips in and out of the port on the regional roadway system. Other activities that generate truck volumes include auto handling, timber, break-bulk, and dry-bulk. Key roadway facilities utilized by port-related truck traffic include SR 509, SR 99, I-5, 54th Avenue, Port of Tacoma Road, Portland Avenue, I-705, 70th Avenue, and River Road/SR 167.

Major terminals at the Port of Tacoma include Totem Ocean Trailer Express Terminal, Pierce County Terminal, Washington United Terminals, Husky Terminal, Olympic Container Terminal and APM terminals. Combined, these terminals generate over 10,000 daily truck trips.[3] The distribution of truck trips was analyzed as part of the 2011 Tideflats Area Transportation Study. Key local origins and destinations for port-related truck trips include the following, with approximately:

- 15 percent of the truck trips to/from the Fife area bounded by 70th Avenue and Freeman Road.
- 12 percent to/from the area bounded by Valley Avenue E, N Levee Road, 70th Avenue and SR 161.
- Longer distance truck trips were distributed with 10 percent on I-5 to the north and 24 percent on I-5 to the south of the project area.

The remaining port-related truck trips were observed to be either internally distributed between different areas of the Port of Tacoma, to/from southeast Tacoma, or to/from other regional state highways.

[2] www.nwseaportalliance.com/sites/default/files/seaport-alliance-5-year_history-12_dec.pdf

[3] Tideflats Area Transportation Study Final Report June 2011

Rail Operations

The project area is served by two intercontinental railroads and a local short line railroad. The majority of rail traffic in the project area services container ships. Existing rail lines also provide passenger service between Vancouver BC, Seattle, Tacoma, and Portland.

Tacoma Rail, an operating division of Tacoma Public Utilities, switches freight between the two intercontinental railroads and also provides service to the Port of Tacoma 24 hours a day, 7 days a week. The railroad has 38 miles of track in the Port of Tacoma area.

Burlington Northern Santa Fe (BNSF) railroad operates rail lines generally throughout much of the United States with Birmingham, Alabama, representing the eastern-most city served by the railroad. In the Northwest, north-south service between major cities generally extends between Vancouver BC and Vancouver, Washington, and Portland, Oregon. East-west service traverses Snoqualmie and Stevens passes to connect with lines extending to the Midwest. Between Seattle and Tacoma, the railroad passes through the cities of Tukwila, Renton, Kent, Auburn, Pacific, Sumner and Puyallup. Approximately 60 freight trains operate daily on the line. Passenger service includes approximately 14 trips per day. The BNSF mainline is located on the south side of the Puyallup River. The BNSF track serving the Port of Tacoma is located west of Port of Tacoma Road. Neither track would be directly affected by the SR 167 Connection Project.

The Central Puget Sound Regional Transit Authority (Sound Transit) operates commuter rail trains between Tacoma and Seattle with 26 trips daily on the BNSF mainline. The service averages more than 16,000 passengers daily between Seattle and Tacoma.

The Union Pacific Railroad (UPRR) mainline operates a single track through the southern portion of the SR 167 Completion Project area. The mainline tracks are part of the UPRR Seattle to Tacoma mainline. Railroad yard facilities are located south of I-5 in the vicinity of Frank Albert Road. South of Tacoma to Portland, Oregon, UPRR trains operate on BNSF tracks. Approximately 16 trains each day use the Seattle to Tacoma mainline. With the exception of Valley Avenue E and Frank Albert Road, local arterial streets cross the railroad at grade. The new segment of SR 167 freeway would construct a bridge over the UPRR mainline west of Freeman Road in Fife.

Transit

The project area lies within the Pierce County Public Transit Benefit Area and Sound Transit service boundary. Pierce Transit provides bus service within the area including local routes servicing Tacoma, Fife, Federal Way, and Milton. Pierce Transit and Sound Transit coordinate to provide express bus service to Seattle and Bellevue. The Tacoma Dome station acts as an intermodal hub for the City of Tacoma providing a 2,400-stall parking garage and transfer facility that allows transit riders access to Pierce Transit and Sound Transit buses, Sound Transit commuter rail, Amtrak passenger rail, and Greyhound inter-city buses. Transit routes operating within the study area include the 500 series express routes serving destinations in King County, the 400 series routes serving Puyallup and east Pierce County, and the local routes serving areas throughout the City of Tacoma with connections at the Tacoma Dome station.

Updated Assumptions and Methodologies

The methodology and assumptions used to analyze the existing and future traffic conditions have been updated since the 2006 FEIS. The key differences between the impact analysis that was conducted for the 2006 FEIS and the updated impact analysis for the Re-evaluation are the years of analysis and the travel demand model and tolling assumptions used to develop traffic volume forecasts.

The operational analysis tools have also seen improvements in technology approaches and robustness. The 2006 analysis was based on an older version of the Transportation Research Board Highway Capacity Manual (HCM 2010) procedures. These procedures have seen multiple updates in analysis methodology, as well as the underlying speed-flow curves. At the time of the 2006 analysis, DTA tools were not available as the technology and software packages did not exist. The current simulation-based DTA model tools, e.g., Dynameq by INRO, allow for blending of traffic assignment capabilities with the intersection/link operational analysis characteristics of traffic simulation tools, hence, providing more accurate traffic forecast assignments. Additionally, these tools are better able to reflect the presence of pricing or tolling and the associated choices and alternatives drivers have for either using or avoiding toll facilities.

2045 Network Assumptions

The 2006 FEIS assessed future traffic conditions for the year 2030. An updated baseline network for the future (2045) Phase 1 No Build condition was developed from transportation plans for the study area. All environmentally approved and funded projects in the study area that are included in relevant local, regional, and state plans are assumed in the 2045 horizon year.

For 2045, projects within Washington State's Connecting Washington Transportation Package are assumed, depending on their published project schedule. In addition, a variety of local projects were assumed from city, county, and state transportation improvement plans (TIPs).

Phase 1 of both the SR 509 Completion Project and the SR 167 Completion Project are assumed to be complete and operational by year 2030, well in advance of the 2045 horizon year. Beyond roadway projects, tolling is also assumed for the horizon year 2045 based on current Washington State legislative intent to toll these facilities.

Tolling Analysis

The 2006 FEIS analysis did not include tolling of the proposed project; whereas, the current Re-evaluation of the Phase 1 Improvements do include tolling as part of the Build Alternative. The intent of tolling the facility is to manage the traffic demand and maximize the operational efficiency of the corridor, as well as pay for a portion of the construction costs. It is assumed that all vehicles will be tolled and time-of-day tolling would be implemented, with higher tolls in the peak periods and lower tolls in the off-peak periods to manage demand. Tolls were assumed to range between $0.75 and $3.00, depending on the peak period and peak direction, and would be charged 2 hours per day.

Further Washington State Transportation Commission action will dictate tolling policy and set operating parameters. However, it is anticipated that any policy changes would remain consistent with the effects shown in this report because any policy changes would still require demand management to provide a reliable trip to users. For this phase of the Dynameq modeling, a relatively low toll rate of $0.75 was used to attract a relatively high volume of traffic to the facilities.

Intersection Analysis

Synchro (version 9) was used to analyze traffic congestion at study area intersections. Synchro uses industry-standard methodologies outlined in the 2010 HCM for isolated intersection analysis.

Intersection performance was measured based on the average seconds of vehicle delay and was reported in terms of LOS. This LOS measurement generally describes operating conditions based on a letter-grade system from LOS A to LOS F. LOS A generally represents ideal operating conditions with little to no delay and where movements are not influenced by other vehicles on the roadway. LOS F represents poor operating conditions, including high delays and extreme congestion. For all jurisdictions

in the study area, the impact threshold below which improvements need to be made is LOS D. The LOS classifications are defined in HCM 2010.

Safety Performance

The WSDOT Olympic region provided updated crash data for I-5, the existing limited access portion of SR 509, and existing SR 167 within the SR 167 Completion Project study area, including River Road, which represents reported crashes occurring between January 2011 and mid-2016. While the focus of this data review and summary was on the I-5 segment through Fife due to the scale of improvements in this area, crash data for the existing SR 167 and SR 509 segments surrounding the I-5 interchange and mainline segment were also summarized. Relevant corridor segments and interchange areas represented include the following:

- I-5 milepost (MP) 135.69 to MP 139.06 (mainline and interchanges)—Fife
- SR 167 MP 5.26 to MP 6.44 (mainline and interchanges)—Puyallup
- SR 167 (River Road) MP 0.59 to MP 6.22
- SR 509 MP 1.66 to MP 3.91 (mainline and interchange areas)—Port of Tacoma

A qualitative assessment of the potential safety performance conditions was performed for the future (2045) No Build and Build conditions.

Effects during Operation

The year of opening for the Phase 1 Improvements (2030) was not analyzed as part of this Re-evaluation. The future long-term effects described in this chapter compare the No Build conditions and the Phase 1 Improvements Build conditions for the year 2045. The results of this No Build to Build comparison were contrasted to the results presented in the 2006 FEIS to understand if there are any new or substantial impacts.

Circulation Changes

Freeway Network

Major circulation changes would occur with the completion of the SR 167 Completion Project. With the SR 509 Spur, the regional freeway network would gain a valuable connection for truck traffic traveling from the Port of Tacoma to the north via I-5 or east via the new SR 167 connection to industrial activity centers in the Fife Valley, Puyallup, and Sumner—and ultimately providing connections to I-90 via SR 18. Additionally, SR 167 traffic previously diverting to River Road to access I-5 south would have a more direct route to I-5 using the new SR 167 connection. Traffic volume reductions are also expected on SR 167 north of Puyallup as traffic uses the new SR 167 connection to access the I-5 corridor rather than use the congested SR 167 facility north to Renton.

Local Roadway Network

With the proposed project, drivers on the local roadway system would be provided access to and from the new SR 167 to the west with a half-diamond interchange at Valley Avenue E and a full, single-point, urban interchange at Meridian Avenue. Local traffic in the Tacoma Tideflats area would also be able to reach I-5 more directly via the SR 509 Spur via a half-diamond interchange with 54th Avenue E. Traffic volumes would be reduced along Valley Avenue E and in existing residential areas near 54th Avenue E, including a high percentage of truck traffic. In addition to 2045 reduced traffic volumes, the improvements recently provided by the City of Fife and the City of Puyallup along Valley Avenue E have improved capacity and operations of the local system. The 70th Avenue overcrossing of I-5 would be

rebuilt with a four-lane structure to replace the existing two-lane facility, thereby increasing capacity on this key crossing of I-5.

Comparison to 2006 FEIS

The improvements proposed for Phase 1 Improvements are expected to provide generally similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS, with the following notable differences:

- In comparison to the grade-separated connection in the 2006 FEIS Build Alternative, the at-grade connection through the SR 509 intersection Alexander Road in the Phase 1 Alternative would result in increased travel time between SR 167/I-5 and downtown Tacoma and Port facilities west of Alexander Road.
- Local access to the new SR 167 to/from the east would not be provided from Valley Avenue E with the Phase 1 Improvements, reducing local access benefits compared to the 2006 FEIS.
- No park-and-ride lots are proposed in the Phase 1 Improvements, compared to the two new park-and-ride facilities proposed in the 2006 FEIS Build Alternative.
- Tolling of the new SR 167 extension and the SR 509 Spur with the Phase 1 Improvements would allow for the capability to sustainably manage the demand using the new facilities.

Traffic Projections

Exhibit 4.1-11 summarizes the 2045 AM and PM peak hour traffic volumes in the study area for the No Build and new Phase 1 Improvements Build conditions, as shown in Exhibit 4.1-12. These traffic projections differ from those developed for the 2006 FEIS because they are based on results from a DTA model, which accounts for the effect of constrained conditions on traffic volumes. In some instances, even though the traffic demand for a facility is higher, the actual throughput volume is lower due to congestion. The DTA model projects this to occur in some instances on I-5 in the peak periods. This effect was not accounted for with the modeling tools used for the 2006 FEIS. Key observations about the forecasted traffic with and without the project include the following:

The Phase 1 Improvements would generally result in slightly increased peak hour traffic volumes on I-5 in the off-peak directions (southbound AM and northbound PM), but in the peak directions would result in minimal to no increases for northbound AM, and minimal increase to notable decrease for southbound PM peak hour traffic. In one case, at I-5 north of the Fife curve, southbound PM traffic volumes for the Phase 1 Improvements would be slightly lower than the No Build as this section of I-5 operates under constrained conditions with lower vehicle throughput.

Peak hour traffic volumes on SR 167 north of Puyallup are expected to decrease with the project in both directions in both peak hours.

Traffic on arterials between Puyallup and I-5, including Valley Avenue, River Road, 70th Avenue, 20th Street, and 54th Avenue are projected to experience notably lower peak hour volumes with the Phase 1 Build Alternative as the SR 167 extension provides a substantially faster connection than the arterials.

Pacific Highway (SR 99) in Fife, is expected to experience reduced peak hour volumes with the Phase 1 Improvements, particularly the section between 54th Avenue and Port of Tacoma Road.

Exhibit 4.1-11 Future (2045) AM and PM Peak Hour Traffic Volumes on Study Area Roads

Measurement Point	Location	AM Peak Hour (vehicles per hour)			PM Peak Hour (vehicles per hour)		
		No Build	Build	+/-	No Build	Build	+/-
1	I-5 south of Port of Tacoma Road	15,490	15,830	2%	14,350	14,620	2%
2	I-5 north of Port of Tacoma Road	15,200	15,580	3%	12,820	13,030	2%
3	I-5 north of the Fife Curve (south of SR 18)	13,470	13,800	2%	11,840	11,580	-2%
4	I-5 north of SR 18	12,770	12,760	0%	13,650	14,050	3%
5	SR 18 west of Military Road	7,460	6,740	-10%	6,910	7,940	15%
6	SR 167 north of 24th Street E	7,300	6,670	-9%	8,330	7,640	-8%
7	SR 167 north of SR 512	6,530	6,540	0%	7,440	7,250	-3%
8	Meridian Avenue south of N Levee Road	3,390	3,130	-8%	4,140	3,290	-21%
9	SR 161 south of 43rd Street Ct E	910	600	-34%	540	700	30%
10	Valley Avenue E east of Freeman Road	1,790	1,230	-31%	1,680	900	-46%
11	Valley Avenue E west of 70th Avenue	1,610	870	-46%	1,390	970	-30%
12	70th Avenue E north of 20th Street E	780	710	-9%	1,280	1,300	2%
13	River Road (SR 167) east of 30th Avenue E	1,920	1,570	-18%	1,960	1,600	-18%
14	54th Avenue E south of 20th Street E	1,790	1,040	-42%	1,540	980	-36%
15	20th Street E east of 54th Avenue E	1,640	1,040	-37%	1,670	800	-52%
16	Pacific Highway (SR 99) east of 54th Avenue E	2,130	1,840	-14%	2,390	1,860	-22%
17	Pacific Highway (SR 99) west of 54th Avenue E	1,680	980	-42%	2,400	1,570	-35%
18	54th Avenue E north of Pacific Highway (SR 99)	1,220	980	-20%	1,360	1,340	-1%
19	Taylor Way east of SR 509	1,100	1,160	5%	1,630	1,410	-13%
20	SR 509 east of Port of Tacoma Road	2,560	2,930	14%	3,560	3,810	7%
21	Pacific Highway (SR 99) north of Porter Way	1,930	1,600	-17%	3,320	3,290	-1%
22	SR 509 Spur west of 54th Avenue E	N/A	1,050	N/A	N/A	1,320	N/A

Exhibit 4.1-11 Future (2045) AM and PM Peak Hour Traffic Volumes on Study Area Roads

Measurement Point	Location	AM Peak Hour (vehicles per hour)			PM Peak Hour (vehicles per hour)		
		No Build	Build	+/-	No Build	Build	+/-
23	SR 509 Spur west of I-5	N/A	1,660	N/A	N/A	2,100	N/A
24	SR 167 Extension east of I-5	N/A	4,200	N/A	N/A	4,080	N/A
25	SR 167 Extension west of Meridian Avenue	N/A	4,150	N/A	N/A	3,910	N/A

N/A = not applicable

Exhibit 4.1-12. Locations for Year 2045 Traffic Volume Measurement Points



Comparison to 2006 FEIS

Key observations regarding differences in traffic projections between the 2006 FEIS and the 2017 TDR include the following:

- Because the 2006 FEIS used an earlier year for existing conditions—year 2000 as compared to year 2016—existing conditions ADT volumes on I-5 overall were lower than the 2017 existing condition by 14 to 18 percent. Also, on SR 167 north of SR 512 they were lower by 33 percent and on SR 512 south of SR 167 they were lower by 39 percent. However, on SR 509 across the Tacoma Tideflats between Alexander Road and Port of Tacoma Road they remained relatively unchanged between the 2006 FEIS and the 2017 analysis.
- Future year traffic forecasts for study area roadways in the 2017 condition are also lower than those in the 2006 FEIS. This is due to multiple factors. The current forecasting tools provide higher resolution as they are able to constrain volumes more realistically than the 2006 tools. Additionally, the inclusion of tolling to manage demand has reduced some volumes on the new facilities. The future forecasts generated in 2006 and 2017, however, show similar patterns of increased demand on the existing facilities.

Highway Performance

Peak Period Congestion and Queues

Under the proposed Phase 1 Improvements Build conditions, congestion patterns would be somewhat similar to No Build. Minor differences include slightly less congestion around the Port of Tacoma Road interchange area during the 6:00 to 7:00 a.m. time period; but slightly more congestion emanating from the on-ramp at the new SR 167 interchange during the 7:30 to 9:00 a.m. time frame. The level of congestion expected at SR 18 is similar to what is projected for the No Build condition.

Congested conditions are expected throughout the peak period in the southern portion of the corridor—beginning south of the Puyallup River Bridge and reaching back to the Fife curve area. In the proposed Phase 1 Improvements Build condition, congestion is expected to form around the new SR 167 interchange and around the Fife curve, but not extend back to the SR 18 interchange—indicating an improvement over the No Build condition.

Peak Period Travel Times

Exhibit 4.1-13 shows travel times during the AM peak period between key activity nodes in both directions for the routes shown in Exhibit 4.1-14. The table shows estimated travel times between nodes using current routes, and also for routes using the new facilities, where applicable. For current routes, travel times would be generally the same with Build conditions compared to No Build, with slight increases for some routes, and decreases for others. Routes 3 and 5, which connect the Port of Tacoma with Sumner and Puyallup, respectively, show a decrease in travel times via the current routes, which indicates that trips would shift away from current routes onto the new SR 167 connection. For Routes 2 through 5, travel times for trips using the Build facilities are improved over the corresponding trips in the No Build condition for all directions.

Most notable travel time reductions include between:

- Puyallup and I-5 north - decreases by 7 minutes northbound (39 percent reduction) and 7 minutes southbound (39 percent reduction).
- Port of Tacoma and Sumner - decreases by 6 minutes eastbound (24 percent reduction) and 7 minutes westbound (29 percent reduction).

- Port of Tacoma and Puyallup – decreases by 5 minutes eastbound (25 percent reduction) and 12 minutes westbound (44 percent reduction).

Travel time Route 1, reflecting travel on I-5 between I-705 and SR 18, shows a slight increase in travel times due to the higher volumes of traffic using this section, while travel times on Route 4 between the Port of Tacoma and SR 18 (east of SR 167) are expected to decrease by 11 percent eastbound and 7 percent westbound.

Exhibit 4.1-13. Future (2045) AM Peak Period (6:00–9:00 a.m.) Travel Times from Dynameq Model

Travel Paths		Direction	Via Current Route (minutes)			Via Build Route (minutes)	
ID #	Path Description		No Build	Build	% +/-	Build	% +/-
1	Through study area on I-5 (I-705 to SR 18)	NB	15	18	+20	N/A	N/A
		SB	9	10	+11	N/A	N/A
2	Puyallup to north of SR 18	NB	22	21	-5	15	-32
		SB	18	19	+6	11	-39
3	Port of Tacoma to Sumner/Pacific MIC	EB	25	24	-4	19	-24
		WB	24	22	-8	17	-29
4	Port of Tacoma to SR 18	NB	18	20	+11	16	-11
		SB	14	16	+14	13	-7
5	Port of Tacoma to Puyallup	EB	20	18	-10	15	-25
		WB	27	21	-22	15	-44

NB = northbound; SB = southbound; EB = eastbound; WB = westbound

Exhibit 4.1-14. Year 2045 No Build and Build Travel Time Paths Measured in Dynameq Model



PM peak hour travel times from the Dynameq model are shown in Exhibit 4.1-15. For current routes, travel times would be generally lower with Build conditions indicating that trips would shift away from current routes onto the SR 167 extension. For Routes 2 through 5, travel times for trips using the Build facilities are improved over the corresponding trips in the No Build condition for all directions.

Most notable travel time reductions include between:

- Puyallup and I-5 north - decreases by 6 minutes northbound (33 percent reduction) and 7 minutes southbound (32 percent reduction).
- Port of Tacoma and Sumner - decreases by 9 minutes eastbound (35 percent reduction) and 15 minutes westbound (41 percent reduction).
- Port of Tacoma and SR 18 east of SR 167 – decreases by 8 minutes northbound (47 reduction) and 24 minutes southbound (41 percent reduction).
- Port of Tacoma and Puyallup – decreases by 9 minutes eastbound (38 percent reduction) and 11 minutes westbound (38 percent reduction).

Exhibit 4.1-15. Future (2045) PM Peak Period (3:00–6:00 p.m.) Travel Times from Dynameq Model

Travel Paths		Direction	Via Current Route (minutes)			Via Build Route (minutes)	
ID #	Path Description		No Build	Build	% +/-	Build	% +/-
1	Through study area on I-5 (SR 705 to SR 18)	NB	11	12	+9	N/A	N/A
		SB	28	25	-11	N/A	N/A
2	Puyallup to north of SR 18	NB	18	18	0	12	-33
		SB	22	21	-5	15	-32
3	Port of Tacoma to Sumner/Pacific MIC	EB	26	25	-4	17	-35
		WB	37	28	-14	22	-41
4	Port of Tacoma to SR 18	NB	17	19	+12	9	-47
		SB	34	24	-29	10	-41
5	Port of Tacoma to Puyallup	EB	24	20	-17	15	-38
		WB	29	24	-17	18	-38

NB = northbound; SB = southbound; EB = eastbound; WB = westbound

Comparison to 2006 FEIS

Regarding operations on SR 167 the improvements proposed for Phase 1 Improvements are expected to provide similar or better performance than what was indicated in the 2006 FEIS. For I-5, changes to freeway operations performance for the Phase 1 Improvements would also be generally similar to those with the Build Alternative assessed in the 2006 FEIS, with the following differences:

- The 2006 FEIS indicated that peak-period congestion levels on I-5 would be somewhat better than those that would occur with the No Build Alternative. I-5 was projected to operate at LOS F south of the existing SR 167 interchange (Portland Avenue) and north of the proposed interchange during the PM peak period. However, the 2006 FEIS project was expected to show an improved level of service on the I-5 segments between the existing SR 167 interchange (Portland Avenue) and proposed SR 167 interchange. The current assessment indicates that in 2045 with both the No Build and Phase 1 Build condition I-5 is expected to operate at LOS F

during the peak periods in the peak directions (AM northbound and PM southbound), though the proposed Phase 1 Improvements are expected to improve PM southbound speeds from 19 mph to 31 mph. Other peak direction I-5 speeds are expected to be slightly degraded with the proposed Phase 1 Improvements.

Intersection Level of Service

Exhibit 4.1-16 summarizes the future 2045 intersection LOS for the AM and PM peak hours, respectively, including both the No Build and Build conditions. The locations of these intersections are shown in Exhibit 4.1-17.

Exhibit 4.1-16. Future (2045) AM and PM Peak Hour Intersection Level of Service

Int#	Location		Intersection Type	AM Peak Hour		PM Peak Hour	
				No Build	Build	No Build	Build
1	Port of Tacoma Rd	20th Ave	Signalized	B	B	B	B
2	Port of Tacoma Rd	NB I-5 on/off ramp	Signalized	A	A	A	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	A	B	B	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	C	C	D	C
5	Port of Tacoma Rd	NB SR 509/12th Street E	Signalized	B	A	C	B
6	Port of Tacoma Rd	SB SR 509	Signalized	B	A	C	C
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	E	C	B	B
8	Alexander Ave	NB SR 509	Signalized	F	C	C	D
9	Alexander Ave	SB SR 509	Signalized	F	D	F	E
10	54th Ave	Valley Ave	Signalized	C	B	A	A
11	54th Ave	23rd St	Signalized	B	A	A	A
12	54th Ave	20th St	Signalized	E	D	E	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	F	A	E	D
14	54th Ave	SB I-5 on/off ramp	Signalized	C	C	B	B
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	E	E	E	D
16	54th Ave	12th St	Signalized	A	A	B	B
17	54th Ave	8th St	Signalized	A	A	B	B
18	54th Ave	4th St	Stop-controlled	A	A	A	A
19	54th Ave	SR 509/Taylor Way	Signalized	E	D	F	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	F	B	F	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	F	A	F	B
22	70th Ave	20th Ave	Signalized	D	C	F	C
23	70th Ave	Valley Ave	Signalized	D	C	D	C

Exhibit 4.1-16. Future (2045) AM and PM Peak Hour Intersection Level of Service

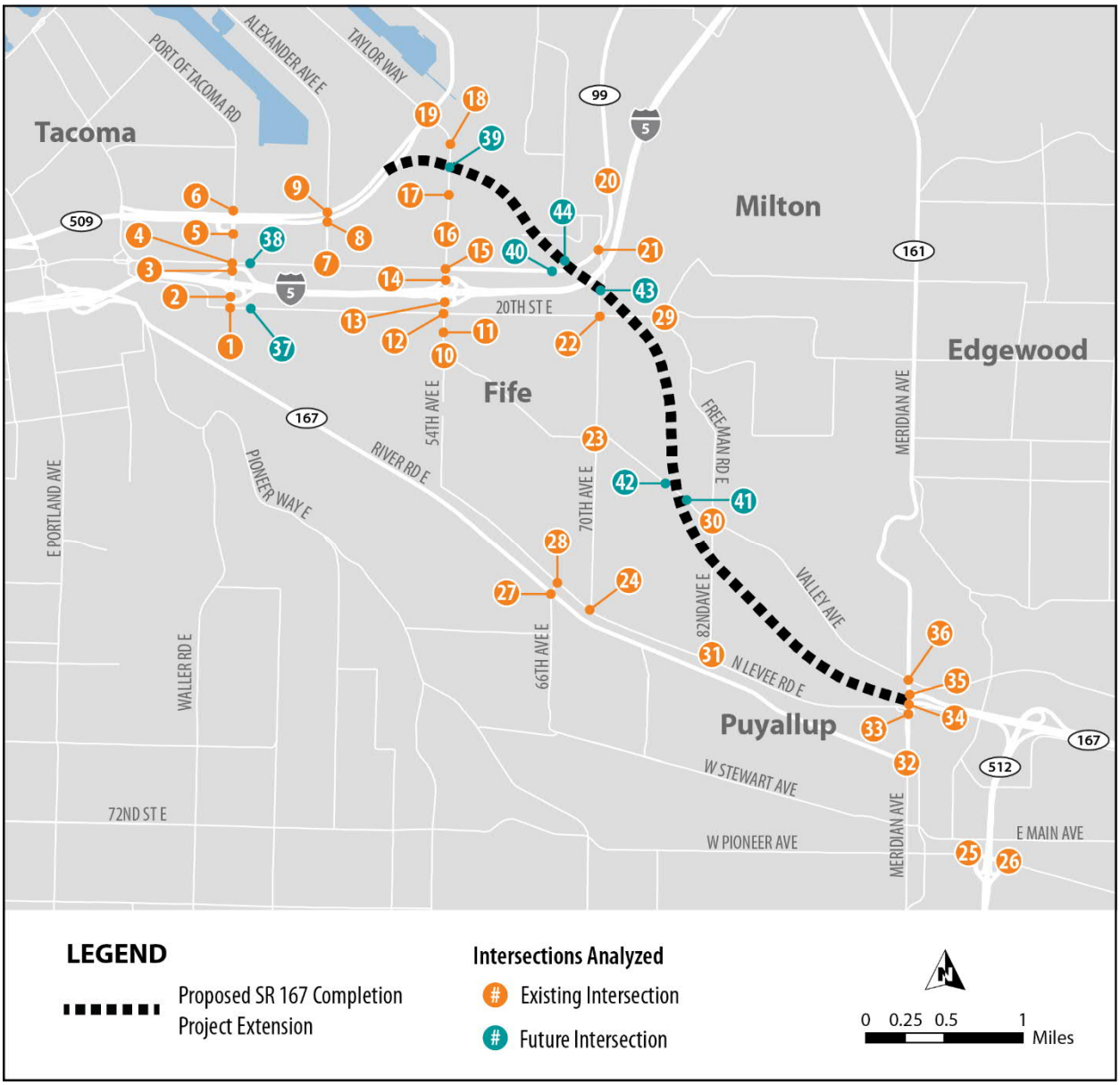
Int#	Location		Intersection Type	AM Peak Hour		PM Peak Hour	
				No Build	Build	No Build	Build
24	70th Ave	North Levee Rd	Stop-controlled	F	B	F	A
25	Pioneer Way	WB SR 512	Signalized	B	B	B	A
26	Pioneer Way	EB SR 512	Signalized	E	D	C	D
27	66th St	River Rd E (SR 167)	Signalized	E	E	E	E
28	66th St	North Levee Rd	Stop-controlled	D	D	B	A
29	Freeman Rd	20th Ave/Yuma St	Signalized	D	C	D	B
30	Freeman Rd	Valley Ave	Signalized	C	A	E	B
31	82nd Ave	North Levee Rd	Stop-controlled	A	A	A	A
32	N Meridian Ave	River Rd E SR 167	Signalized	E	D	F	C
33	N Meridian Ave	4th Street NE	Stop-controlled	A	A	A	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	D	A	B	A
35	N Meridian Ave	SR 167	Signalized	E	D	D	D
36	N Meridian Ave	Valley Ave	Signalized	E	D	F	D
37	34th Ave	20th Ave	Future Intersection	A	A	A	A
38	34th Ave	SR 99 (Pacific Hwy)	Future Intersection	B	B	B	B
39	54th Ave	SR 167	Future Intersection	N/A	B	N/A	B
40	SR 99 (Pacific Hwy)	70th Ave	Future Intersection	N/A	C	N/A[a]	D
41	Valley Ave	SR 167 NB Ramps	Future Intersection	N/A	B	N/A	B
42	Valley Ave	SR 167 SB Ramps	Future Intersection	N/A	A	N/A	B
43	SR 167	NB I-5 Ramp	Future Intersection	N/A	C	N/A	B
44	SR 167	SB I-5 Ramp	Future Intersection	N/A	B	N/A	C

Yellow shading indicates intersection operates at LOS standard (LOS D), while red shading indicates intersection operates below LOS standard (LOS E or F).

[a] In the No Build, the original location of the SR 99/70th Avenue intersection is projected to operate at LOS F (intersection 21).

N/A = not applicable

Exhibit 4.1-17. Locations of Intersections Analyzed (2045)



AM Peak Hour

In the 2045 AM peak hour, 20 of the 38 study intersections in the No Build condition are forecast to operate at or below the current standard of LOS D, compared to 10 out of 44 intersections in Build conditions. In the No Build condition, six intersections operate at LOS F, whereas, in the Build condition, all the intersections operate at LOS E or better. This is due to forecasted redistribution in traffic demand volumes and selected intersection improvements under the Build conditions.

The following two intersections are projected to operate below their respective LOS standards—LOS E, in the 2045 AM No Build and AM Build condition:

- 54th Avenue E/SR 99-Pacific Highway would operate at LOS E due to high delays at the westbound approach.
- 48th Street E/66th Avenue E/ River Road E would operate at LOS E because of longer delays caused by northbound and southbound traffic along 66th Avenue E.

All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the AM peak hour.

PM Peak Hour

As shown in Exhibit 4.1-16, 17 of the 38 study intersections in the No Build condition are forecast to operate at or below the LOS D standard in the 2045 PM peak hour, compared to only 11 of the 44 intersections in the Build condition. In the No Build condition eight intersections operate at LOS F, whereas, in the Build condition no intersections operate at LOS F and only three are expected to operate at LOS E.

The following intersections are projected to operate below their respective LOS standard in the 2045 PM Build condition:

- Alexander Avenue E/SR 509 (southbound) would operate at LOS E due in large part to the high delay at the northbound approach.
- 48th Street E/66th Avenue E/ River Road E would operate at LOS E due to high delays caused by northbound and southbound traffic along 66th Avenue E.
- 54th Avenue E/SR 509 would operate at LOS E due to heavy traffic from all approaches.

One intersection, Alexander Avenue E/SR 509 (northbound), would operate at LOS D in the Build condition, though it would operate at LOS C in the No Build condition. The slight degradation in operations is due to a higher redistribution of trips to the area in the Build versus the No Build condition. However, the intersection meets the LOS D threshold and does not require mitigation.

All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the PM peak hour with the exception of the relocated SR 99/70th Avenue intersection, which is projected to operate at LOS D. This compares to LOS F for the SR 99/70th Avenue intersection under the No Build conditions.

Comparison to 2006 FEIS

The 2006 FEIS considered intersection operations for the PM peak hour only. The current analysis assesses operations for both the AM and PM peak hours. Of the 32 intersections analyzed in the 2006 FEIS No Build conditions for the future horizon year of 2030, 26 were projected to operate at or below the LOS D standard, with 25 at LOS E or F. This was expected to be reduced in the 2006 FEIS Build Alternative to 18 out of 38 intersections at LOS D or worse with 16 of those being at LOS E or worse. This compares to 20 of the 38 intersections in the current assessment being at LOS D or worse in the 2045

AM peak hour and 17 intersections in the PM peak hour under No Build conditions. Conditions improve in the proposed Phase 1 Build condition where 11 of the 44 intersections being at LOS D or worse for both the AM and PM peak hours. No specific adverse substantial impacts on intersection operations were identified in the 2006 FEIS for the Build Alternative, and the current analysis results in the same overall conclusion for the proposed Phase 1 Improvements.

Transportation Safety Performance Impacts

In the 2045 No Build condition, higher traffic volumes and levels of congestion are anticipated on the major roadways in the study area, including I-5, SR 509, SR 167, SR 161, SR 99, and other nearby arterials. As traffic volumes and congestion increases, the potential number of crashes may increase as well, although the crash rate may not change because the volumes may increase at the same rate as crashes.

The Phase 1 Improvements would draw traffic demand away from nearby facilities, including SR 167 north of Puyallup, SR 161 north of Puyallup, River Road, Valley Avenue E, 20th Street E, and 54th Avenue south of I-5. In general, the reduction of traffic demand on these facilities and lower level of congestion would potentially cause a reduction in the number of crashes on those facilities, even though the crash rate may not change compared to No Build.

On the segment of I-5 through the project area, traffic volumes in the off-peak directions (southbound AM and northbound PM) are expected to increase compared to No Build, the potential number of crashes may increase as well, although the crash rate may not change because the volumes may increase at the same rate as crashes. However, volume increases are minimal to none in the northbound AM peak direction; and are expected to decrease some for southbound PM peak hour traffic. These changes would likely result in similar to fewer number of crashes for the Build even though the crash rate may not change compared to No Build.

The SR 167 extension segment between Meridian Avenue and I-5 would provide a new access-controlled facility with improved safety performance conditions. Research over the past several decades has consistently shown that crash rates increase as driveway density increases on a roadway (i.e., number of driveways per mile). The benefits of a limited access facility like the SR 167 extension include improved movement of traffic, reduced crashes, and fewer vehicle conflicts (FHWA 2014). In addition, the facility would be tolled in order to manage traffic demand and congestion levels. The resulting lower levels of congestion of a managed toll facility will likely result in fewer number of crashes in comparison to a nontolled facility.

Lower levels of congestion on arterials that include bicycle and pedestrian facilities could also possibly lead to fewer conflicts, even if the facilities may provide minimal improvements.

Comparison to 2006 FEIS

Safety performance effects of the proposed Phase 1 Improvements are expected to be similar to what was presented in the 2006 FEIS, which stated:

"Construction of the Build Alternative is expected to reduce the number of accidents within the corridor by providing a safer facility with full-access control. Year 2030 congestion levels at many key intersections will be lower than the No Build Alternative, which should result in a reduced number of accidents occurring at these intersections."

Impacts on Port, Railroad, and Transit Facilities

The Build Alternative would greatly improve traffic traveling to and from the Port of Tacoma. Truck traffic would have a direct connection to SR 167 providing an alternative to I-5 north of the project area

and the ability to bypass the highly congested interchanges at Port of Tacoma Road and 54th Avenue. Local truck trips to major trucking destinations of 70th Avenue and Valley Avenue E to the southeast of the Port of Tacoma area would also benefit from the improved connection.

Travel times were estimated for key truck origin/destination pairs and provide insight into the magnitude of improvements that would be experienced for truck trips with the completion of the project.

AM Peak projected travel time savings for the future (2045) build scenario include the following:

- 32 to 48 percent travel time savings between Port of Tacoma Road and Puyallup
- 24 to 29 percent travel time savings between Port of Tacoma Road and the Sumner/Pacific Manufacturing Industrial Center (MIC)
- 11 to 16 percent travel time savings between 54th Avenue and the Kent MIC
- 16 to 19 percent travel time savings between 54th Avenue and SR 18

No other substantial impacts are expected to railroad facilities or service.

Transit facilities and routes would not be affected by the proposed facility. The proposed SR 167 extension would create opportunities for new routes serving the Sumner area should Pierce Transit view that as a viable transit market. Some impacts on transit headways may be anticipated during construction and temporary detours. Coordination with Pierce Transit would be critical in limiting increased travel times due to construction activities. In addition, the planned Link light rail extension to Tacoma will cross the proposed new SR 167 extension. WSDOT and Sound Transit would need to coordinate design and construction activities for both projects.

Comparison to 2006 FEIS

The effects of the proposed Phase 1 Improvements on port, railroad, and transit activities are expected to be similar to what was presented in the 2006 FEIS, which stated:

"The Build Alternative will greatly improve traffic traveling to and from the Port of Tacoma. The northbound I-5 access will be more direct via SR 167 with free-flowing conditions. Port traffic to Eastern Washington can remain on SR 167 to access I-90 via I-405 or SR 18 in Kent, avoiding the steep grade portion of SR 18 near I-5."

Two park-and-ride lots included in the 2006 FEIS are not included in the list of proposed Phase 1 Improvements because they are no longer being pursued by Pierce Transit. Further, the 2006 FEIS assumed that direct freeway connections would be provided for the SR 167 GP and HOV lanes at the I-5/SR 167 interchange. The Phase 1 Improvements design proposes a diverging diamond interchange between I-5 and SR 167 and does not include center-to-center HOV direct connections; however, the design does not preclude them. Future HOV direct connections could be accommodated using a flyover type configuration for the proposed I-5/SR 167/SR 509 spur diverging diamond interchange.

Effects during Construction

The temporary construction effects discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than the 2006 FEIS Build Alternative.

Currently, the Phase 1 Improvements are anticipated to be constructed in two stages based on funding cash flow.

Listed below are the project elements associated with each stage:

- Stage 1: Relocation of the 70th Avenue crossing of I-5 and construction of the SR 509 Spur connecting the current SR 509 with I-5 (anticipated completion by 2025).
- Stage 2: Completion of the SR 167 Extension between I-5 and SR 161 in Puyallup (anticipated completion by 2030).

Along the length of the corridor, construction impacts on traffic operations would occur. The timing and extent of closures and/or detours would be determined in the design phase of the project. The detour routing plan would also analyze effects of rerouted traffic on detour routes and develop an operations plan to mitigate the effects of the increases in traffic.

Construction of the I-5 interchange would require placement of SR 167 mainline and ramp structures over I-5 travel lanes. I-5 freeway lane closures would be limited to nighttime periods of low traffic volumes. Advisory signing and media notices would give advance warning of any extended lane closures. Most overhead roadways would be constructed in phases, allowing surface street traffic to be maintained by shifting traffic from one side of the road to the other.

Construction activities would be coordinated with UPRR, BNSF, Tacoma Rail, and the Port of Tacoma to minimize disruption of rail operations through the project construction areas.

WSDOT construction practices would be followed for detour traffic signing and traffic operations through construction work zones. To the extent possible, traffic disruptions from adjacent local improvement projects would be coordinated to minimize delay on the surface streets.

Mitigation

The analysis of the No Build to Build alternative for year 2045 shows that most of the local streets and intersections would operate better with the Build alternative, resulting in improved travel times. I-5 shows a slight increase in travel time in the northbound direction during the AM peak period, but shows a reduction in travel time in the southbound direction during the PM peak period. The analysis also shows an improvement in safety performance at all locations surrounding the project, as well as better connectivity for bikes and pedestrians. The analysis identified an existing bottleneck at the northbound offramp to SR 18. The addition of an I-5 second northbound offramp to SR 18 are assumed in the Build condition and are funded by the same source as this project. Capacity improvements to I-5 from Tacoma to Tukwila are a regional issue and are being analyzed by WSDOT's Management of Mobility Office.

The Phase 1 Improvements would result in operations at the intersection of Alexander Road and Northbound SR 509 degrading from LOS C to LOS D in the 2045 PM peak hour. However, since the intersection would meet the City of Tacoma's LOS threshold of LOS D for this area, it would not require mitigation.

The SR 167 Tier II FEIS Traffic Report identified traffic mitigation measures in the project area and the design team has reviewed each location and determined whether each mitigation can be included or are appropriate in the Phase 1 project (Exhibit 4.1-18).

Exhibit 4.1-18. Previously Identified Traffic Mitigation Areas

Location	Mitigation	Previous Outcome	Current Outcome (Phase 1)
Existing SR 167: SR 161 to SR 512 (both directions)	Add auxiliary lanes	Added to design	Maintain in design
Intersection of 20th St/70th Ave	Add 2 roundabouts	Added to design	No longer relevant for revised Phase 1 design, therefore, not included.

Comparison to 2006 FEIS

The 2006 FEIS identified two transportation-related mitigation measures as shown in Exhibit 4.1-18, which were subsequently added to the proposed design, which included the following:

- Existing SR 167: SR 161 to SR 512 – add auxiliary lanes in both directions
- Intersection of 20th Street/70th Avenue – add two roundabouts

The first of these, the auxiliary lanes on SR 167 between SR 161 (Meridian Avenue) and SR 512 have been incorporated into the Phase 1 Improvements design. The second one, the roundabouts at the intersection of 20th Street/70th Avenue, has been determined to not be necessary for mitigation purposes. The Phase 1 Improvements would not include grade separation of SR 509 with Alexander Road (which was assumed in the 2006 FEIS Build Alternative) and analysis indicates that operations at the northbound SR 509 intersection with Alexander Road would degrade from LOS C to LOS D under the Phase 1 Build condition in the 2045 PM peak hour. However, since the intersection would meet the City of Tacoma's LOS threshold of LOS D for this area, it would not require mitigation.

The 2006 FEIS included two park-and-ride lots: SR 161 and Valley Avenue E park-and-ride lots. The Phase 1 Improvements would not include these or any other park-and-ride lots.

The mitigation measures during construction as described in Section 3.14.4 of the 2006 FEIS and under the transportation section of the 2007 ROD remains applicable to the Phase 1 Improvements.

Conclusion

Overall, this transportation analysis indicates that even with the updated assumptions and methodologies, there would be an improvement in traffic operations and no new significant traffic effects as a result of the Phase 1 Improvements. See also Attachment A, Transportation Discipline Report.

4.2 Environmental Justice

Affected Environment

Methods

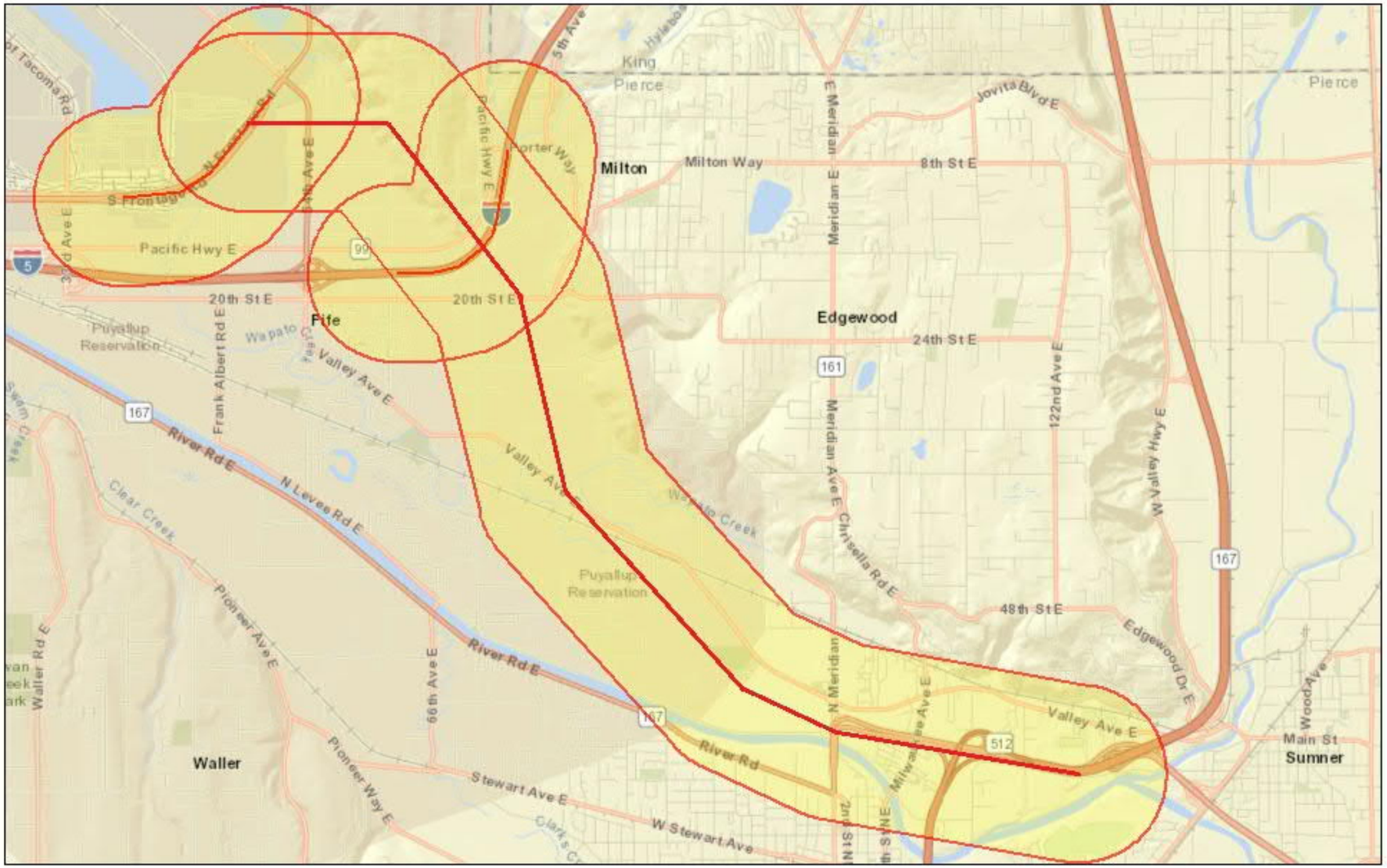
WSDOT conducted an environmental justice analysis in 2004 to support the 2006 FEIS. Since that time, the discipline of environmental justice and the tools for analysis have evolved. Federal and state guidelines continue to refine definitions of disproportionately affected populations and the methodology for conducting an environmental justice analysis. For example, the analysis conducted for the 2006 FEIS did not consider effects to limited English proficient populations. Since 2011, WSDOT has required that environmental justice analyses consider effects to limited English proficient populations, especially because there is some overlap between impacts on these populations and other environmental justice groups.

Study Area

To analyze potential effects of construction and operation of the new proposed SR 167 Phase 1 Improvements on environmental justice populations, WSDOT used the same study area as described in the 2006 FEIS environmental justice analysis, which included the geographic area within 0.5 mile of the project alignment. Exhibit 4.2-1 shows the SR 167 Phase 1 Improvements study area.

To analyze potential benefits and adverse effects of tolling on environmental justice populations, WSDOT examined the forecasted travelshed for the future SR 167 Phase 1 Improvements tolled facility. The travelshed is the geographic area from which users of the future SR 167 tolled facility would originate. The tolled portion of the new SR 167 facility does not yet exist, so WSDOT had to make educated assumptions about where users of the future SR 167 facility will originate. WSDOT used regional traffic models to make these educated assumptions (WSDOT 2017).

Exhibit 4.2-1. SR 167 Phase 1 Improvements Study Area –0.5 Mile



April 25, 2018

Buffer Area

Digitized Line

1:72,224

0 0.5 1 2 mi

0 1 2 4 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),

Data Collection

The 2006 FEIS used the Census data available at that time, which was from the 2000 Decennial Census. To show how demographics in the project area have changed since the 2006 FEIS, WSDOT compared the demographic data from the 2000 Census to the most recently available demographic data from American Community Survey 5-year estimates. Sources of data informing this Phase 1 Improvements analysis of potential effects and benefits include the following:

- 2000 Decennial Census (U.S. Census Bureau)
- American Community Survey (ACS) 5-year estimates, 2011–2015 and 2012–2016 (U.S. Census Bureau)
- Demographic data from the Washington State Office of the Superintendent of Public Instruction (OSPI) for the 2016–2017 school year
- EJScreen (an online tool and service provided by the U.S. Environmental Protection Agency) data on minority, low-income, and limited English proficient populations

Although ACS data are estimates, for the purpose of this analysis, the estimates are more useful than using 2010 Census data alone because 2010 Census data are almost 10 years old (it was collected in 2009). WSDOT used these data to identify potentially affected populations and neighborhoods in the project study area and travelshed of the proposed Phase 1 Improvements.

Public Involvement

Public involvement with communities in the study area has influenced the scope of the new proposed Phase 1 Improvements. Members of the public have had an opportunity to review several design options, varying from the 2006 FEIS Build Alternative to options that would use a much smaller footprint and have substantially fewer impacts. Through this outreach and engagement, WSDOT was able to reflect community and stakeholder input in the development of the scope and design for the Phase 1 Improvements.

Since planning began for the Phase 1 Improvements in 2015, WSDOT held two rounds of public open houses (March 2016 and April 2017). Over 150 people attended the open houses in March 2016, and nearly 200 people attended the open house in April 2017. For the 2016 open houses, WSDOT notified community members through group email lists, social media, news releases, and English and Spanish-language flyers provided to cities and school districts in the project area. For the open house in 2017, WSDOT used these same methods and also mailed postcards—which were translated into Spanish—to nearly 10,250 households and local businesses.

WSDOT formed a steering committee comprising staff from the local jurisdictions in the study area and an executive committee composed of elected officials from jurisdictions within the study area. WSDOT held six steering committee meetings and four executive committee meetings from December 2016 to May 2017.

In addition, to develop and inform consultation strategies with environmental justice communities on the project, from November 1 to 28, 2016, WSDOT scheduled and conducted interviews with 10 community-based organizations and social service providers in the study areas:

- FISH Food Bank
- Korean Women's Association
- Metropolitan Development Center

- Pierce County Housing Authority
- SeaMar Community Health Centers
- The Reach Center
- Tacoma Community House
- Tacoma Housing Authority
- Tacoma/Pierce County Affordable Housing Consortium
- Tacoma Rescue Mission

These organizations also helped distribute emails about the April 2017 open houses to their constituents and clients.

As part of this environmental justice analysis, WSDOT studied summaries from these service provider interviews, as well as summaries from the public open houses and Steering Committee and Executive Committee meetings. WSDOT looked for issues of concern for low-income, minority, and/or limited English proficient populations to explore further in this environmental justice analysis. WSDOT used results from this public involvement to identify potentially affected populations, neighborhoods, social resources, public services, and community cohesion in the study areas, potential benefits and adverse impacts of the Phase I Improvements, and potential mitigation for adverse impacts. The public involvement process also informed development of potential mitigation for the potential adverse effects of tolling.

Tribal Consultations

Tribes are considered environmental justice populations, and approximately three-quarters of the project area is located within the Puyallup Tribe of Indians (PTOI) reservation.

WSDOT engages with potentially affected tribes through multiple approaches. These include an established Section 106 process for identifying and protecting cultural resources (historic and archaeological), the previously mentioned Executive and Steering Committee meetings, technical assistance and advisory groups, and formal government to government consultation.

Prior to the 2006 FEIS, WSDOT consulted the PTOI to secure information about traditional cultural properties, culturally sensitive locations, fish passage, or other effects to the tribe within or adjacent to the project area. Since then, WSDOT has held two formal consultations with the PTOI in April 2016 and June 2017. The purpose of the first consultation was to provide a project update and discuss tribal concerns related to property impacts, tolling, and natural and cultural resources. The second consultation was to provide a project update and discuss the tribe's concerns about tolling through the reservation.

The State of Washington and the PTOI are party to the Puyallup Tribe Land Claims Settlement Agreement of August 28, 1988, ratified by Congress in P.L. 101-41, implemented in part by Washington state legislation enacted in 1989, adopted by the court in Puyallup Tribe of Indians v. Union Pacific Railroad Co., Civil No. C84-359TC (W.E. Wash. March 24, 1990), and to the subsequent modifications. Consistent with the terms of the land claims settlement agreement and subsequent modifications, WSDOT agrees it will not collect tolls from Puyallup tribal members and tribal government vehicles traveling on state highways within the surveyed 1873 Puyallup Reservation boundaries. An agreement between WSDOT and PTOI for these exemptions from any tolls is nearing completion for final signatures.

WSDOT would continue to consult with the PTOI via the processes described above—including ongoing environmental justice outreach—throughout the design and construction of the Phase 1 Improvements.

Distribution of Environmental Justice Populations

The 2006 FEIS reported minority population data at the block level and used multiple indicators, such as average rent, to extrapolate poverty data at the block level. Today, the U.S. Census Bureau estimates minority and poverty data at the block group level. As such, it is not possible to use the data reported in the 2006 FEIS environmental justice analysis to compare the current (2018) conditions with conditions in 2006. For this 2018 analysis, WSDOT used census block group-level data from the U.S. Decennial Census in 2000 to show demographic conditions in 2006.

Exhibit 4.2-2 compares demographic conditions in 2006 to the present. WSDOT's analysis shows that, since the November 2006 FEIS was published, the percentage of individuals identifying as a minority has increased from nearly 13 percent to just over 17 percent. The percentage of households with incomes at or below the federal poverty level increased slightly in the study area from about 9 percent to over 10 percent.

Note that the U.S. Census Bureau reset many census block groups between the 2000 and 2010 Census. As such, seven block groups no longer exist, and there are 14 new census block groups that did not exist in 2006. The shaded cells in Exhibit 4.2-2 are those for which there are no data because the block group did not exist for that time period.

Exhibit 4.2-2. Minority and Low-Income Populations in the SR 167 Phase 1 Improvements Study Area

Census Tract	Block Group	Percent Identifying as Minority		Percent of Households at or Below Poverty Level	
		2006[a] (%)	2018[b] (%)	2006[c,d] (%)	2018[e](%)
705	1	4.20		7.20	
705	2	8.26		6.67	
705	3	12.93		8.26	
707.03	1	8.52	14.38	10.07	4.51
707.03	4	6.16	8.10	11.85	0.78
707.03	5	6.92	25.79	6.93	12.10
707.04	1	5.45		6.18	
707.04	2	8.0		7.59	
709	1	13.16		6.67	
709	2	22.0		9.62	
709	3	43.27		18.35	
734.07	1		19.24		5.96
734.07	2		9.36		8.63
734.07	3		14.67		17.60
734.08	1		14.02		10.89
9400.02	1		12.39		7.66
9400.02	2		54.21		19.18
9400.02	3		36.07		12.36
9400.03	2		42.64		11.31
9400.03	3		35.5		16.38
9400.09	1		12.73		6.51

Exhibit 4.2-2. Minority and Low-Income Populations in the SR 167 Phase 1 Improvements Study Area

Census Tract	Block Group	Percent Identifying as Minority		Percent of Households at or Below Poverty Level	
		2006[a] (%)	2018[b] (%)	2006[c,d] (%)	2018[e](%)
9400.09	2		9.07		0
9400.10	1		19.23		13.50
9400.10	2		6.90		8.46
Average for Study Area		12.63	20.89	9.04	9.74

[a] Source: U.S. Census Bureau Census 2000 (2001)

[b] Source: U.S. Census Bureau 2011-2015 American Community Survey 5-Year Estimates (2016)

[c] Source: U.S. Census Bureau Census 2000 (2001) (estimated)

[d] In 2000, the U.S. Census did not report poverty status. To calculate poverty status, the analyst added the number of households with incomes at or below the 2000 U.S. Department of Health and Human Services poverty guidelines for the 48 contiguous states and D.C., which was $19,950 for a household of five individuals.

[e] Source: United States Census Bureau 2011-2015 American Community Survey 5-Year Estimates (2016)

WSDOT compared the data from the U.S. Census and American Community Survey with data from the Washington Office of Superintendent of Public Instruction (OSPI), which collects and archives demographic information from all public schools in the state. Exhibit 4.2-3 compares conditions in 2006 to the present in each of the seven elementary schools in the SR 167 Phase 1 Improvements study area. It shows the percentage of students identifying as a minority and the percentage of students eligible for free- and reduced-price lunches, which is a proxy for low-income status during the 2005–2006 and 2016–2017 school years.

These data show even more dramatic shifts in demographics than the census data. The percent of students identifying as minority for all elementary schools in the study area grew from just over 22 percent in 2006 to just over 47 percent in 2017. The percent of students eligible for free- and reduced-price lunch grew from nearly 24 percent to just over 44 percent.

Exhibit 4.2-3. Comparison of Data for Students Enrolled in Public Elementary Schools in the SR 167 Phase 1 Improvements Study Area

Elementary School	Percent of Students Identifying as Minority (%)		Percent of Students Eligible for Free- and Reduced-Price Lunch (%)	
	2005-2006	2016-2017	2005-2006	2016-2017
Northeast Tacoma	34.0	57.7	34.6	46.8
Northwood	18.0	47.8	18.4	31.1
Mountain View	8.0	32.0	19.2	40.2
Stewart	29.2	47.8	23.0	55.6
Karshner	21.9	57.4	19.1	51.0
Waller Road	15.1	40.8	13.4	49.6
Hedden	28.9	46.4	36.7	35.2
Average for all elementary schools in study area	22.2	47.1	23.5	44.2

Source: Washington Office of Superintendent of Public Instruction, 2005-06 and 2016-17 school years

Consideration of Limited English Proficient Populations

Limited English proficiency was not included in the 2006 FEIS. Exhibit 4.2-4 shows the percentages of limited English proficient households in the study area. In the study area as a whole, only 2.5 percent of households are limited English proficient, which is relatively small for the region. That said, there are three census block groups where the percentage of limited English proficient households is higher than 5 percent.

Exhibit 4.2-4. Percentage of Limited English Speaking Households in the SR 167 Phase 1 Improvements Study Area

Census Tract	Block Group	2018 Analysis (%)
707.03	5	0
707.04	2	0
709	1	0
734.07	3	0
734.08	1	0
9400.02	1	0
9400.02	2	2.05
9400.02	3	8.60
9400.03	2	2.95
9400.03	3	5.61
9400.09	1	5.05
9400.09	2	7.42
9400.10	1	1.23
9400.10	2	0
Average for Study Area		2.5

Source: American Community Survey Five-Year Estimates, 2011-2015 (estimated). Note that limited English proficiency was not evaluated in 2006.

WSDOT confirmed limited English proficient populations with 2005–2006 and 2016–2017 transitional and bilingual data available from OSPI. Exhibit 4.2-5 compares the percentage of transitional or bilingual students in study area schools in 2006 with the present.

The EJ Screen tool indicates there are 78 linguistically isolated households in the study area (EJ Screen 2017). The majority of linguistically isolated households in the study area speak an Asian language at home; Spanish-speaking linguistically isolated households are less common in the study area. If demographic data indicate 5 percent of the population or more than 1,000 persons within 0.5 mile of the project area speak English less than well, WSDOT must provide equal access to project information in their language (WSDOT 2017). According to the demographic data, fewer than 1,000 people and only 2.5 percent of the study area speak English less than well, indicating that translation is not required in the Phase 1 Improvements study area.

On the other hand, of the households that are anticipated to be displaced by the Phase 1 Improvements, some are linguistically isolated and Spanish speaking. WSDOT is providing translated documents and Spanish-language interpreters to the affected households. WSDOT would also provide translation and interpretation services to other affected community members upon request.

Exhibit 4.2-5. Percentage of Transitional or Bilingual Students in the SR 167 Phase 1 Improvements Study Area Schools

School Name	Percentage of Transitional or Bilingual Students	
	2005-2006 (%)	2016-2017 (%)
Northeast Tacoma	6.2	20.0
Northwood	1.7	11.0
Mountain View	2.2	5.2
Stewart	3.9	7.1
Karshner	10.9	21.4
Waller Road	2.6	6.8
Hedden	10.9	9.8
Average for all elementary schools in study area	5.5	11.6

Source: Washington Office of Superintendent of Public Instruction, 2005-06 and 2016-17.

Environmental Justice Populations Who May Be Potential Users of Tolled SR 167 Phase 1 Improvements

With the addition of tolling for the Phase 1 Improvements, WSDOT also has to consider whether environmental justice populations would be users of the new SR 167 Phase 1 Improvements. This section provides a demographic analysis of the SR 167 travelshed (the geographic area from which SR 167 users are expected to originate).

To determine whether WSDOT should translate materials to be distributed to the public about tolling into other languages, WSDOT conducted a demographic analysis of language groups in the Phase 1 Improvements travelshed. WSDOT found a number of census block groups where 5 percent or more of the population is linguistically isolated and speaks Spanish at home. WSDOT also found a number of census block groups where 5 percent or more of the population is linguistically isolated and speaks an Asian or Pacific Islander language at home. The census groups Asian and Pacific Islander languages into one category, so it is more difficult to determine if 5 percent or more of the population of a block group speaks Chinese, Vietnamese, Cambodian, or another Asian language. These data, coupled with feedback from interviews with social service providers, indicate WSDOT should translate toll-related information into Samoan (considered a Pacific Islander language), Cambodian, Chinese, and Vietnamese, in addition to Spanish.

Effects during Operation

Based on WSDOT's analysis, described in detail below, tolling of the Phase 1 Improvements would not have disproportionately high and adverse effects on low-income populations.

Potential Benefits to All Users, Including Environmental Justice Populations

Travel through the study area would generally improve with the SR 167 Phase 1 Improvements project. The project would provide motorists with the option to pay the toll and use the new facility, and receive a faster, more reliable trip. Most trips on existing routes in the project area would be the same or faster than without the project. Most intersections in the project area would improve with the project.

Potential Effects of Tolling on Environmental Justice Populations

When the Washington State Legislature funded the Phase 1 Improvements, it intended for the improvements to be fully tolled. The 2006 FEIS Build Alternative did not include tolling of the new

facility, so the 2006 FEIS did not analyze or identify environmental justice benefits or effects related to tolling. This section describes WSDOT's analysis of the potential effects of the proposed new tolling on low-income, minority, and limited English proficient individuals.

A 2009 research report conducted by the University of Washington and funded by WSDOT recommended asking the following questions to determine whether a specific toll will have a disproportionately high and adverse effect on certain populations (Plotnick et al. 2009):

1. How would different households use the transportation facilities after a toll is imposed?
2. How would tolls affect the economic status of low-income and non-low-income households, on average?
3. How would travel times improve for residents who choose tolled routes and worsen for those who do not?
4. How would the potential travel behavior changes differ by income status?

Based on the analysis, WSDOT concludes the toll would not have a disproportionately high and adverse impact on low-income, minority, and/or limited English proficient users. The University of Washington report concluded that most low-income residents in the Puget Sound region would not be adversely affected by tolling, as long as there were accessible and convenient alternatives to paying the toll (Plotnick et al. 2009). Nontolled routes would remain accessible and convenient alternatives to the new tolled Phase 1 Improvements and WSDOT anticipates offering close to the same or slightly improved travel times for motorists compared to the No Build conditions. As such, tolls would not have a disproportionately high and adverse effect on low-income or limited English proficient residents who travel in the study area.

Other Effects to Environmental Justice Populations

Exhibit 4.2-6 compares adverse permanent impacts of the proposed Phase 1 Improvements with the 2006 FEIS Build Alternative. WSDOT did not find any other impacts that would disproportionately affect environmental justice populations.

Exhibit 4.2-6. Comparison Summary of Impacts: 2006 FEIS Build Alternative and Phase 1 Improvements

Noise – 2006 Build Alternative	Phase 1 Improvements
Under the Build Alternative, noise levels were predicted to increase in the SR 167 study area from 2 to 18 A-weighted decibels (dBA). The greatest increase in noise levels under the Build Alternative would be near the Puyallup Recreation Center along the portion of the Valley Road approaching North Meridian. Additional modeling indicated noise would remain below FHWA criteria where people are likely to congregate. Noise levels at 45 out of 60 sites would approach or exceed the FHWA criteria under the Build Alternative in 2030.	Phase 1 would result in one new effect compared to the 2006 FEIS. There is one key difference since the 2006 FEIS in the affected environment. The Fife Heights residences were not built at the time of the 2006 FEIS, so WSDOT did not evaluate that area for noise impacts. For the Phase 1 Improvement evaluation, WSDOT predicts noise levels would exceed FHWA criteria for abatement. Phase 1 Improvements would not result in any other new or significant noise impacts. Fewer residences would approach or exceed FWHA noise abatement criteria compared to the 2006 FEIS Build Alternative due to the smaller project footprint and lower predicted traffic volumes.
Displacements of Residents – 2006 Build Alternative	**Phase 1 Improvements**
Under the Build Alternative, WSDOT would displace 83 single-family residential units, 12 multifamily apartment units, and 17 manufactured home units. The majority of anticipated displacements would occur within the Fife city limits. The residences are mostly older single-family residential units located in the North Fife area and in the vicinity of the I-5 interchange near 70th Avenue E. WSDOT already purchased several parcels between 2000 and 2006, prior to the Tier II FEIS. Since the Tier II FEIS was published in November 2006, WSDOT continued to acquire property for the project ROW. Since October 2017, WSDOT has purchased and relocated 58 single family homes	Phase 1 would not result in any new or significant impacts compared to the 2006 FEIS. Phase 1 improvements require slightly fewer residential acquisitions than the 2006 Build Alternative. Since most of those acquisitions have already taken place, Phase 1 would require only 43 more residential acquisitions—all single-family and manufactured homes. According to the WSDOT staff working on the relocations, there has been very little to no turnover in ownership amongst most of the homeowners affected by displacements. In other words, most are the same homeowners as when the 2006 FEIS was written. Of the 43 residential relocations, 17 relocations are at manufactured homes with tenants who are likely to be low income. Six families in residence are Hispanic. Some of these families are limited English proficient. The 2006 FEIS Environmental Justice Discipline Report disclosed these impacts on low income residents, so although some of the tenants of the Hylebos Creek Estates mobile home park may have changed since 2006, overall impacts on low income residents are not new to the 2018 analysis.

Exhibit 4.2-6. Comparison Summary of Impacts: 2006 FEIS Build Alternative and Phase 1 Improvements

Community Cohesion – Build Alternative	Phase 1 Improvements
As described in the 2006 FEIS, displacements of residents, bisection of neighborhoods by the new highway structure, and the disruption of access to community facilities and services would adversely affect community cohesion. The 2006 FEIS concludes that adverse impacts on community cohesion would be low. It also concluded the completed project would have an overall positive effect on community cohesion because of improved movement of people and goods through the project area.	Phase 1 would not result in any new or substantial impacts compared to the 2006 FEIS.
Effects to businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations – 2006 Build Alternative	**Phase 1 Improvements**
Under the Build Alternative, WSDOT would acquire and displace 22 to 27 businesses, one public facility, and one farming operation. There are no public facilities (hospitals, schools, and police departments) located within the project corridor. The Build Alternative would not separate public services from the communities they serve. The Build Alternative would not affect school district service areas.	Phase 1 would not result in any new or substantial impacts compared to the 2006 FEIS. The Phase 1 Improvements would result in the acquisition of fewer commercial properties and the relocation of 10 fewer businesses than estimated for the 2006 FEIS Build Alternative. All of the displaced businesses are small businesses with few employees, none of whom are environmental justice populations. There may be at least one displaced business owners who identifies as minority. The 2006 Environmental Justice Discipline Report disclosed these impacts. Phase 1 Improvements would not result in any new or substantial impacts on public services, community facilities, or utilities beyond those discussed for the 2006 FEIS Build Alternative. No community facilities would be displaced as a result of Phase 1 Improvements. Changes in access are not expected to affect any public services. Once the construction of the Phase 1 Improvements is complete, emergency response times and access to community facilities are expected to improve because of the projects' effects on traffic congestion.
Parks and Recreational Resources – 2006 Build Alternative	**Phase 1 Improvements**
The Build Alternative would relocate Hylebos Creek from its current location, which is a degraded ditch adjacent to I-5 to a more natural meandering channel. To implement this improvement, the Build Alternative would affect two facilities—a recreational center and a trail. When the FEIS was published in 2006, the City of Fife planned to develop the Pacific National Soccer Park—a city-owned and operated soccer facility. The Build Alternative would require use of six of 18 of the planned soccer fields for this facility. The demographic analysis confirms there are environmental justice	Phase 1 would not result in any new or substantial impacts compared to the 2006 FEIS. Phase 1 Improvements would enhance the Hylebos Nature Area. The Pacific National Soccer Park is no longer a planned facility, so Phase 1 would not affect it. Phase 1 would affect the Interurban Trail, similar to the Build Alternative, but it would also make several pedestrian and bicycle improvements in the vicinity of the interurban trail and intersection of 70th Avenue E and SR 99. This includes a new shared-use path on the 70th Avenue E overpass over SR 99 that would

Exhibit 4.2-6. Comparison Summary of Impacts: 2006 FEIS Build Alternative and Phase 1 Improvements

populations who live in Fife—54 percent identify as minority and 20 percent have incomes below the poverty level (2011-2015 ACS 5-Year Estimates) The Build Alternative would relocate the southern terminus of the Interurban Trail and affect access to the trail. The southern terminus of the Interurban Trail is along the border of Fife Heights and Milton, where the demographic analysis confirms the presence of environmental justice populations. Milton and Fife have lower proportions of minority residents than Pierce County as a whole, but 19 percent of Milton residents and 24 percent of Fife Heights identify as minority. Although only about 6 percent of Milton and Fife Heights residents have incomes below the poverty level, there are four census block groups near the pedestrian and bicycle improvements where 20 percent or more of individual have incomes below the poverty level—nearly double the poverty rate for King County and higher than the poverty rate for Pierce County. (2011-2015 ACS 5-Year Estimates)	eventually connect with the Hylebos Wildlife Trail, improved pedestrian connections to the Interurban Trail, and a new Interurban Trail gateway parking lot. These improvements are in Milton and Fife Heights. As described earlier, the demographic analysis confirms there are environmental justice residents in these communities.

Effects during Construction

WSDOT did not identify any construction impacts different from those described in the 2006 FEIS. Temporary construction-related effects to residents, businesses, and motorists in the study area—including environmental justice populations—would be the same as those described in the 2006 FEIS, including:

- Construction-related dust and noise
- Traffic congestion that may temporarily alter neighborhood travel patterns
- Visual presence of construction equipment and materials

The 2006 FEIS describes temporary construction impacts on the Benthien Loop neighborhood in the area of 54th Avenue E near the Port of Tacoma, Fife Heights, the City of Fife, and Milton. These communities would experience construction-related access disruptions, noise, dust, and visual effects. The Benthien Loop and Fife Heights communities have relatively high proportions of environmental justice populations, so these impacts would disproportionately affect environmental justice populations, but they are not new or more substantial impacts than those documented in the 2006 EIS. WSDOT will mitigate for these effects.

- Benthien Loop – 27 percent identify as minority, which is less than Tacoma and similar to Pierce County; 28 percent of individuals have incomes below the poverty level. This is much higher than Tacoma and more than double the poverty rate for Pierce County. (2011–2015 ACS 5-Year Estimates)
- Fife – 53 percent identify as minority, which is considerably higher than Pierce County. Much of Fife includes the Puyallup Indian Tribe Reservation, and Native Americans are among the groups considered to be minority under the President's Executive Order on Environmental Justice; 20 percent of individuals have incomes below the poverty level, which is higher than the poverty rate for Pierce County. In one census block group in Fife, more than 51 percent of the population has incomes below the poverty level. (2011-2015 ACS 5-Year Estimates). According

to EJ Screen, there is at least one census block group in Fife where more than 5 percent of households are linguistically isolated and speak Spanish. (EJ Screen 2017)

Mitigation

Mitigation for Effects of Tolling

WSDOT did not find that a toll would cause a disproportionately high and adverse effect on environmental justice populations requiring mitigation. Nonetheless, to minimize the disproportionate effects of the all-electronic toll system on limited English proficient populations, WSDOT will translate information about electronic tolling into multiple languages. WSDOT's demographic analysis did not indicate that general project information should be translated, but when WSDOT interviewed community and social-service providers in 2017, it recommended translation of materials about the project and tolling into Russian, Samoan, Spanish, Vietnamese, Chinese, and Cambodian.

Although no further mitigation is required, WSDOT anticipates exempting transit and paratransit (special transportation services for people with disabilities) from the tolls, which should further minimize the impacts of tolls on environmental justice populations. WSDOT exempts transit and paratransit on existing tolled facilities, but the Washington State Transportation Commission makes the final decision about toll exemptions. WSDOT is also planning to continue making it easier for people without a bank account to purchase and pre-load a Good To Go! pass—for example, selling them in local grocery stores and pharmacies and allowing people to use cash to load them. WSDOT is planning to expand the network for retail pass sales and options for customers who do not have a credit or debit card with which to open and maintain a Good To Go! pass, but there at the time of publication of this discipline report, there were no concrete details about the expansion.

Outcomes from interviews with community-based organizations and social service providers echo these recommendations.

Mitigation for Other Permanent Effects

Exhibit 4.2-7 compares mitigation outlined in the 2006 FEIS for Build Alternative with proposed mitigation for the Phase 1 Improvements.

Exhibit 4.2-7. Comparison Summary of Mitigation: 2006 FEIS Build Alternative and Phase 1 Improvements

Noise – 2006 Build Alternative	Phase 1 Improvements
WSDOT will provide noise barriers at appropriate areas where residents would likely be affected by traffic noise and where construction of the barriers is justified (through evaluation of feasible and reasonable criteria). Other possible mitigation measure could include building insulation and retaining existing trees and vegetation, thereby reducing noise annoyance psychologically by removing the noise source from view and constructing landforms.	Although Phase 1 improvements would not result in any new or substantial noise impacts, there is one difference in noise mitigation since the 2006 FEIS. Just north of the future I-5/SR 167 interchange in Fife Heights, there are new residences that were not built at the time of the 2006 FEIS. As such, WSDOT did not recommend a noise barrier at that location in the 2006 FEIS. Now that there are residences in the vicinity, WSDOT evaluated a noise barrier in that location, but it did not meet both the feasible and reasonable criteria. As such, WSDOT is not proposing a noise wall at this location.
Displacements of Residents – 2006 Build Alternative	**Phase 1 Improvements**
Displaced residents are eligible for relocation assistance to find suitable and comparable relocation sites under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended. WSDOT is required to relocate displaced residents to a residence with similar costs and access to services. Review of the study area on July 14, 2006, identified 186 single-family homes for sale. WSDOT identified 83 single-family homes for rent, as well as 47 apartment complexes with vacancies. Therefore, more-than-adequate housing should be available for all persons displaced.	Mitigation for Phase 1 residential displacements would be the same as those described in the 2006 FEIS. For the six Hispanic families identified to date who are displaced, WSDOT has translated all documents related to the process into Spanish and engaged Spanish-language interpreters to attend all meetings with the families. The relocations will not take place until later in 2018, but with WSDOT's assistance, all six families have been able to locate comparable replacement housing in the same neighborhood as their current residences.
Community Cohesion – Build Alternative	**Phase 1 Improvements**
The 2006 FEIS concludes the effects to community cohesion would be minimal. To the extent possible, the final design would minimize the need for property acquisitions, which would further minimize effects on community cohesion.	WSDOT did not identify any new or substantial impacts on community cohesion.
Effects to businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations – 2006 Build Alternative	**Phase 1 Improvements**
Effects to fire, emergency, and police services during construction will be limited to temporary disruptions of service routes within the construction zone. Service providers affected by construction will be notified in advance of the construction period. Police, fire and emergency response, school districts, and solid waste providers will be notified of construction schedules, access restrictions, and possible detour routes prior to access modification. To the extent possible, WSDOT will coordinate the scheduling of road closures and detour routes with police, fire, and emergency services, school districts and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will conform to state	Mitigation for effects to businesses, community gathering places, and faith-based organizations of importance to environmental justice populations will be the same as described in the 2006 FEIS. WSDOT did not identify any new or substantial impacts on businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations.

Exhibit 4.2-7. Comparison Summary of Mitigation: 2006 FEIS Build Alternative and Phase 1 Improvements

and local regulations. Restricting lane closures and construction activities that affect traffic during peak commute hours and peak holiday travel periods can help to ease backups and time delays. Maintaining an open communication process will keep local residents informed of development phases, areas of construction, and possible travel alternatives.	
Parks and Recreational Resources – 2006 Build Alternative	Phase 1 Improvements
Through coordination with City of Fife, WSDOT incorporated elements into the 2006 Build Alternative design that will benefit the Pacific National Soccer Park. This includes strategies to reduce potential flood impacts on the Park. WSDOT also prepared an alternative design of the SR 167/I-5 interchange that reduced impacts on the planned soccer complex and allowed for six more soccer fields. WSDOT also committed to maintaining access to the Interurban Trail	Phase 1 does not include any new impacts requiring mitigation.

Mitigation measures during construction have not changed since the 2006 FEIS. The SR 167 Puyallup to SR 509 Land Use, Farmland, Social-Economic, and Environmental Justice Discipline Report (November 2004) outlines the following mitigation measures:

- Completing the project in phases to minimize disturbance to local residences and businesses
- Notifying first responders and school districts of construction schedules, access restrictions, and detour routes
- Conforming to local and state regulations for traffic control and restricting lane closures during peak commute hours and holiday travel periods

In addition, WSDOT will take these mitigation measures:

- Applying best management practices (BMPs) to control dust, noise, and visual impacts
- Developing and implementing traffic management plans to minimize traffic congestion and the effects of increased construction-related truck traffic on surrounding neighborhoods and arterials
- Requiring the contractors to provide at least one week's notice for major or highly disruptive construction activities
- When WSDOT notifies residents of Fife about construction-related activities, WSDOT will include a Spanish-language version on the notification, since Fife has some pockets of linguistically isolated, Spanish-speaking households.

WSDOT will continue outreach for the Phase 1 Improvements through the project design, construction, and operation phases. Ongoing public involvement activities will include:

- Maintaining ongoing communications with community-based organizations and social service providers throughout design and construction of Phase 1 Improvements, and scheduling briefings and project milestones.

- Distributing project materials through social service agencies, community-based organizations, libraries, community groups, and schools.
- Hosting booths at community events in the study area.
- Conducting media outreach, specifically with ethnic media outlets serving the study area.
- Planning and implementing a public information campaign in English and the languages recommended by service providers who participated in interviews—Spanish, Cambodian, Chinese, Russian, Samoan, and Vietnamese—to explain tolling, how to obtain a Good To Go! pass, and how to set up an account.

Many service providers highlighted the importance of face-to-face communication for low-income populations, with many providers recommending community meetings with interpretation services. They added that a number of limited English proficient residents of the study area may have low literacy in their native language, thus reinforcing the importance of sharing information orally.

Cumulative Effects

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not create cumulative or indirect effects for environmental justice populations.

With the introduction of tolling, WSDOT identified positive and negative cumulative effects of the Phase 1 Improvements on environmental justice populations in the SR 167 travelshed. The Phase 1 Improvements would contribute to a positive cumulative effect on regional transportation and would likely contribute to a negative cumulative effect on the economic burdens of low-income users of SR 167. The Phase 1 Improvements—in conjunction with other reasonable and foreseeable transportation investments in the SR 167 travelshed—would improve transportation conditions for all motorists in the SR 167 travelshed, including environmental justice populations.

As described earlier, tolls on the new proposed Phase 1 Improvements would disproportionately affect low-income populations because the cost to use the new facility would represent a higher proportion of their household income than middle and high-income users. In combination with rising housing costs in the Pierce County and Washington State's regressive tax system, tolling the new SR 167 Phase 1 Improvements facility would have a minor contribution to a negative cumulative effect on economic burdens of low-income motorists in the SR 167 travelshed.

The analysis considered whether multiple tolled facilities in the region would have a cumulative impact on environmental justice populations. Current tolled facilities include the Tacoma Narrows Bridge and SR 520 Bridge, express toll lanes on I-405, and HOV toll lanes on SR 167. Planned tolled facilities include tolling on the new SR 509 extension and an extension of express toll lanes on I-405. The analyst concluded, with the exception of the Tacoma Narrows Bridge, because accessible, convenient alternatives to using these tolled facilities would remain, there would be no negative cumulative effect on low-income motorists.

See also Section 4.18, Indirect and Cumulative Effects.

Conclusion

WSDOT did not identify any indirect impacts of Phase 1 to environmental justice populations.

The adverse effects on environmental justice populations described in this discipline report are similar to those described in the 2006 FEIS, with one important exception: The 2006 FEIS did not include tolling of the Build Alternative. WSDOT's analysis considers the effects of tolling the proposed Phase 1 Improvements on environmental justice populations. WSDOT concludes that given the accessible and

convenient nontolled alternatives that would be available, tolling the new facility would not have a disproportionately high and adverse effect on environmental justice populations. Therefore, there are no new significant impacts related to Environmental Justice.

See also Attachment B, Environmental Justice Discipline Report.

4.3 Water Resources

Affected Environment

The affected environment relative to water resources was described in Section 3.2.2 of the 2006 FEIS. Figures 3.2-2 and 3.2-3 from the 2006 FEIS show the basin boundaries and water features in the study area. The affected environment remains generally applicable to the proposed Phase 1 Improvements. The changes described below relative to surface water quality, groundwater, and floodplains and flooding, reflect changes in regulations or new information, not actual changes in the condition of the existing environment.

Basin Boundaries and Water Resources

Consistent with the 2006 FEIS, the Phase 1 Improvements would potentially affect the quality of water resources in the following three basins:

- Puyallup River basin
- Hylebos Creek basin
- Wapato Creek basin

An important change since 2006 is that WSDOT's SR 167 Puyallup River Bridge Replacement Project at the SR 161 crossing (Meridian Avenue) in Puyallup was completed in 2015. The result is there would be no direct impact on the Puyallup River, and less new impervious surface added by the Phase 1 Improvements in this vicinity.

Surface Water Quality

Consistent with the 2006 FEIS, the Phase 1 Improvements would potentially affect the quality of the surface waters in the areas listed above. Although there has been no documented change (i.e., reports or publicly available data) indicating a changed in water quality in the affected environment since 2006, there have been minor changes in the water quality criteria applied and resulting updated listed impairments to water bodies in the project area. The impaired waters list has been updated twice since the 2006 FEIS was published. Exhibit 4.3-1 summarizes the State of Washington's current Section 303(d) listings for surface waters in the study area.

Clean Water Act Section 303(d) Waters

Exhibit 4.3-1. Section 303(d) Impaired (Category 5) Water Bodies in the SR 167 Completion Project Vicinity

Water Body	Build Alternative (2006 FEIS) 2004 303(d) List	Phase 1 Improvements (Re-Evaluation) 2016 303(d) List
Puyallup River	Bacteria[a]	Temperature, Mercury
Hylebos Creek	Bacteria	Bacteria
East Fork Hylebos Creek	Bacteria	Bacteria, Copper
West Fork Hylebos Creek	No Listings	Temperature, Dissolved Oxygen (DO)
Fife Ditch	DO, Ammonia-N	DO, Ammonia-N
Wapato Creek	Bacteria, DO	Bacteria, DO

[a] In the 2006 FEIS, "FC Bacteria" (referring to fecal coliform bacteria) was listed as the parameter of concern rather than "bacteria." While water quality listings in the project area are based on measurements of fecal coliform bacteria, Washington State's water quality assessment database uses the term bacteria and that terminology is used here for consistency.

Overall, the changes in impairment listing do not represent changes in existing surface water quality conditions. The water quality throughout the project area is generally in the same condition as described in the 2006 FEIS. Although land development has been proceeding quickly in the project vicinity since 2006, much of that development has been required to control or mitigate its potential water quality impacts via inclusion of stormwater treatment facilities.

Groundwater

The groundwater setting discussed in the 2006 FEIS remains generally applicable to the Phase 1 Improvements relative to condition of underlying aquifer, known contaminated sites, impervious surface coverage, and public water supply wells and their associated wellhead protection areas within the project footprint. One public water supply well in the project area has been decommissioned since the FEIS was published, but there are still 25 current public wells with attendant wellhead protection areas.

One new groundwater issue that has arisen since 2006 is heightened concern expressed by some local residents regarding flooding by shallow groundwater and frequency of groundwater flooding in the past 10 years. While no new quantitative data are available to support or negate, to address the concern WSDOT is developing groundwater flow model for the project area and would assess existing shallow groundwater elevations and fluctuations through the year, flow directions, and connectivity of groundwater to creek channels. The information would be used to predict future conditions as affected by the new highway corridor.

The 2006 FEIS highlighted concern with two known contaminated sites affecting groundwater, the B&L Woodwaste Landfill and the US Gypsum site. Both sites have since undergone remediation and are subjects of ongoing monitoring. The data indicate arsenic concentrations continue to be elevated in both surface water and groundwater near the sites, though concentrations are diminishing compared to 2006. The recent Hazardous Materials Technical Memorandum completed to assess impacts of the Phase 1 Improvements indicated no substantive change relative to the affected environment relative to groundwater, but improvement in the information available.

Floodplains and Flooding

In 2006, the acreage of floodplain impact due to the SR 167 Completion Project Phase 1 Improvements was estimated based on mapping of the “flood prone area” overlain on the project footprint area. Since development of the 2006 FEIS, the Federal Emergency Management Agency (FEMA) has published updated flood insurance rate maps for the Puyallup River and selected streams in the project area, as reflected in the National Flood Hazard Layer (NFHL) hosted online (updated in March 2017). Pierce County and the cities in the SR 167 Completion Project Phase 1 Improvements area have adopted the updated flood insurance rate maps for regulatory purposes. The newly published (FEMA 2017) 100-year floodplains were utilized to represent existing conditions.

Effects during Operation

Water Quality

The surface water impacts discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements, except that the Phase 1 Improvements would create substantially less impervious surface area than the 2006 Build Alternative. The Phase 1 Improvements would create 75.6 acres of new impervious surface area as compared to the 175.4 acres of new impervious surface area with the Build Alternative (Exhibit 4.3-2), due to the overall smaller footprint of the proposed Phase 1 Improvements.

Exhibit 4.3-2 Comparison of Impervious Surface Area Added by SR 167 Completion Project

Basin	Acres of Impervious Surfaces	
	2006 FEIS Build Alternative	Phase 1 Improvements[a]
Hylebos[b]	129.4	46.4
Wapato	28.0	7.5
Lower Puyallup River	18[c]	21.7
TOTAL	175.4[d]	75.6

[a] These estimates are from the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). These are the best available estimates as of May 2018. They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

[b] Fife Ditch is included in the Hylebos basin for this analysis.

[c] This was not reported in the 2006 FEIS but was estimated to be 50 percent of the approximately 33 to 39 acres of new impervious surface not accounted for in the Hylebos and Wapato basin estimates. Based on this, 18 acres were estimated for the Lower Puyallup River basin.

[d] This is not the same number reported in the 2006 FEIS because it includes the estimated acreage in the Lower Puyallup River basin.

Impervious surface was used as a surrogate measure of water quality impacts in the 2006 FEIS. Exhibit 4.3-3 summarizes the predicted annual pollutant loads as reported in the 2006 FEIS and as calculated for the proposed Phase 1 Improvements. As shown, pollutant loads generated as a result of the Phase 1 Improvements are anticipated to decrease by 57 percent when compared to the loads predicted under the 2006 FEIS Build Alternative, correlating to the decrease in impervious surface area.

Exhibit 4.3-3. Comparison of Pollutant Loading from Untreated Stormwater Generated by the SR 167 Completion Project Impervious Surfaces

	2006 FEIS Build Alternative	Phase 1 Improvements
Acres of Impervious Surfaces Added	175.4	75.6[a]
Pollutant	Pollutant Load (Kilograms/Year) (Pounds/Year in parentheses)	
Total suspended solids (TSS)	35,633 (78,557)	15,322 (33,779)
Total phosphorus (TP)	78 (172)	34 (75)
Total nitrogen (TN)	170 (375)	73 (161)
Lead, total (Pb)	55 (121)	24 (53)
Zinc, total (Zn)	22 (49)	10 (22)
Copper, total (Cu)	4 (9)	2 (4)

[a] This estimate is from the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). It may change as the design progresses, but any change is not expected to substantially change the level of impact.

Stormwater Treatment

The pollutant loading estimates shown in Exhibit 4.3-3 do not account for effectiveness of required stormwater treatment facilities, and actual reductions are anticipated to be even higher. Stormwater generated by the highway would be required to meet the most recent version of the WSDOT Highway Runoff Manual (HRM). This means that at a minimum, Basic Treatment requirements would need to be met. However, based on the HRM, for the majority of the project area Enhanced Treatment (to ensure

greater removal of dissolved metals) will be required; and WSDOT is proposing its use for the entire project, where practicable, consistent with the 2006 FEIS.

The parameters included on the Section 303(d) list at the time for project receiving waters (i.e., bacteria, dissolved oxygen, and ammonia) were not typically associated with highway runoff (WSDOT 2006). For the proposed Phase 1 Improvements, temperature, a recently added listing for the West Fork of Hylebos Creek. However, the volume of rainfall that occurs during summer is typically small and it is expected that runoff would only infrequently reach streams in the project area during summer; therefore, the proposed Phase 1 Improvements are not expected to directly affect surface water temperatures at critical times.

Mercury is another more recent water quality impairment listing in the project area but is not a contaminant that is typically associated with highway runoff. Copper, however, has recently been identified as an impairment in the East Fork of Hylebos Creek, and is a contaminant common in highway runoff. The HRM requires that Enhanced Treatment be provided for the majority of the highway, and it is WSDOT's stated intent to provide Enhanced Treatment wherever practicable on the project. Enhanced Treatment goals include removal of greater than 30 percent of dissolved copper.

Overall, stormwater treatment requirements will essentially be the same between the 2006 FEIS and proposed Phase 1 Improvements. Thus, the potential for loading of these pollutants to streams in the project area, including those with listed impairments, does not change. The improved and wider stream buffers associated with the Riparian Restoration Program (RRP) areas is also anticipated to result in removal of some of the pollutants that are being delivered to Hylebos Creek under existing conditions.

Groundwater

Potential groundwater impacts described in the 2006 FEIS were associated with increased potential for contaminant spills from vehicles using the roadway, as well as potential for contaminants associated with WSDOT maintenance activities, such as herbicides and pesticides or de-icing materials, and are effectively the same for the proposed Phase 1 Improvements.

Another potential impact on groundwater that was evaluated in the 2006 FEIS was a possible decrease in aquifer recharge due to increased soil compaction and increased impervious surface area, both of which would increase stormwater runoff at the expense of groundwater infiltration and recharge. The substantial reduction in impervious surface area resulting from the proposed Phase 1 Improvements, as compared to the FEIS Build Alternative, should equate to a decreased risk of reducing aquifer recharge. However, the scale of this reduction is not substantial when compared to the influence of larger surrounding land areas in the Puyallup River valley on aquifer recharge.

Riparian Restoration Program

The Hylebos RRP has evolved since the 2006 FEIS; the overall size of the riparian buffer area has been substantially reduced and the location shifted because of property ownership changes, but a longer contiguous corridor of the stream would be protected (Exhibit 4.3-4). In the Surprise Lake Tributary area, the Phase 1 Improvements would result in a slight decrease in restored buffer and a substantial reduction in the length of stream corridor protected compared to the 2006 FEIS. Overall, the stream length and riparian buffer improvements in the Hylebos basin (Hylebos and Surprise Lake Drain) represent 5 percent and 15 percent reduction, respectively, from the improvements assumed for the 2006 FEIS Build Alternative.

Exhibit 4.3-4. Comparison of Stream Improvements and Riparian Restoration Program Buffers Between the 2006 FEIS Build Alternative and Proposed Phase 1 Improvements

Project Elements	Build Alternative (2006 FEIS)	Phase 1 Improvements (Re-evaluation)[a]
Hylebos Stream Improvements (feet)	4,010	4,500
Hylebos Riparian Buffer (acres)	87	70
Surprise Lake Drain Stream Improvements (feet)	5,340	4,380
Surprise Lake Drain Riparian Buffer (acres)	29	28
Wapato Creek Riparian Buffer (acres)	73	12
Total Stream Improvements (feet)	9,350	8,880
Total Riparian Buffer Gains (acres)	189	110

[a] These estimates are from Table 2 in the April 2018 ESA Section 7 Formal Re-initiation report (NMFS 2018). These are the best available estimates as of September 2018. They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

At the time of the 2006 FEIS, the RRP design was still conceptual and had not been formally submitted to resource agencies for review. As shown in Exhibit 4.3-4, the Wapato RRP as conceived for the 2006 FEIS Build Alternative potentially included 73 acres of riparian buffer. The size of the buffer area did not correlate to roadway impacts but to opportunities associated with available undeveloped areas. The Wapato RRP described for the Phase 1 Improvements includes 12 acres of riparian restoration, a decrease when compared to the Wapato RRP concept discussed in the 2006 FEIS. Again, the size of the proposed Wapato RRP is based on opportunities, rather than impacts. For example, WSDOT would not be acquiring a 21-acre parcel that was previously needed for a loop ramp that is no longer in the proposed Phase 1 Improvements design plans. That parcel was to be part of the Wapato RRP as originally conceived, and this opportunity no longer exists.

Effects during Construction

The temporary construction effects discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements, except that the area of disturbance would be smaller than the 2006 Build Alternative. This determination is based on an evaluation of acres of land subject to clearing and grading, the number of stream crossings, and the total number of near-water work sites, which is defined as the sum of the temporary, new, and improved or removed stream crossings. These impacts are summarized in Exhibit 4.3-5. As shown, construction impacts are substantially reduced under the proposed Phase 1 Improvements for nearly all types of impacts considered. The one exception is that there is one additional wellhead protection zone that would be crossed under the Phase 1 Improvements, but overall, the Phase 1 Improvements have a greatly reduced level of construction impacts both for total acres of clearing and grading and the number of near-water work sites.

Exhibit 4.3-5. Comparison of Construction Impacts between the 2006 FEIS Build Alternative and Proposed Phase 1 Improvements

Project Elements	Build Alternative (2006 FEIS)	Phase 1 Improvements (Re-Evaluation)[a]
Acres of Clearing and Grading (includes that associated with RRP)	720	375
Wellhead Protection Zones Crossed	22	23
Temporary Stream Crossings	12	0
New Stream Crossings	13	7
Existing Stream Crossings Improved or Removed	23	12
Near-Water Work Sites	48	21

[a] These estimates are from the April 2018 ESA Section 7 Formal Re-initiation report (NMFS 2018). They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

Construction impacts on water resources resulting from the project would also include those associated with relocation/construction of new stream channels, and restoration of riparian areas and riparian buffers that are planned to mitigate for project impacts. As described previously (Exhibit 4.3-4) the stream channel and riparian buffer improvements would be reduced under the proposed Phase 1 Improvements; thus, the Phase 1 Improvements would have a reduced level of construction impacts compared to the 2006 FEIS Build Alternative.

There are also water quality risks associated with existing contaminated sites. Disruption of these sites during construction could result in the release of contaminants to water resources. The major construction activities where soil and groundwater contamination could be encountered would be associated with drilled shafts and the construction of new stream corridors. Four sites of potential concern will have drilled shafts constructed in them. The soil and/or groundwater contamination in these specific areas will be characterized to determine the appropriate cleanup measures. Project design changes for the Phase 1 Improvements have already occurred to avoid excavation and grading in proximity to known areas of contamination, or otherwise assuring those areas will be cleaned up before SR 167 Completion Project Phase 1 Improvements construction occurs. The proposed realignment of Hylebos Creek and Surprise Lake Tributary as part of the RRP will avoid the B&L Woodwaste Landfill and the existing Hylebos Creek channel near the US Gypsum Highway 99 site west of I-5 will be filled, thus, reducing the risk of water quality impacts associated with these sites.

Mitigation

Overall mitigation needs would be similar between the 2006 FEIS Build Alternative and the Phase 1 Improvements.

As summarized in Section 3.2.9 of the 2006 FEIS, operational impacts on water resources can largely be avoided or mitigated through thoughtful design and will be further mitigated as the design progresses through local, state, and federal environmental permitting. Operational mitigation measures in the 2006 FEIS were related to reducing flood elevations at the 20th Street E and northbound I-5 bridges, designing all new stream crossings to pass the 100-year storm event at a minimum, and minimizing channel construction and riprap placement at these crossing. These mitigation measures were environmental commitments in the 2007 ROD and will remain commitments under the new proposed Phase 1 Improvements.

The construction mitigation measures as described in Sections 3.2.8 and 3.2.9 of the 2006 FEIS remain applicable to the proposed Phase 1 Improvements and as documented in the 2007 ROD.

A Temporary Erosion and Sediment Control (TESC) Plan and a Spill Prevention, Control, and Countermeasures (SPCC) Plan will be prepared and implemented during each stage of project construction, as required by the HRM (WSDOT 2016).

Mitigation during construction will, at a minimum, include:

- Erosion control measures for cut and fill slopes
- Sediment control measures, particularly for work near streams and storm drain inlets
- Temporary erosion protection measures for disturbed areas
- Reseeding and stabilization for cut and fill slopes as necessary
- Reseeding and/or replanting of temporarily impacted areas with appropriate native seed mixes/species to the greatest extent possible
- Confining fuels, oils, and other potential contaminants within a berm or barrier when staging areas cannot be located outside of frequently flooded areas
- Limiting fueling and vehicle maintenance near water bodies and sensitive areas
- Identifying proper construction equipment maintenance, cleaning, and access locations
- Requiring proper hazardous and conventional waste disposal
- Scheduling and timing of construction activities appropriate for the season
- Monitoring and maintaining erosion and sediment control BMPs

In addition to TESC and SPCC Plans, the following project-specific measures will minimize effects on water resources during construction:

- A Stormwater Pollution Prevention Plan (SWPPP) will be fully implemented before, during, and after construction.
- Alternative construction techniques that minimize or avoid dewatering (e.g., sheet piling, cased piers, driven piling, spread footings) will be evaluated.
- A temporary Hylebos Creek diversion channel will be constructed while the creek remains within its existing streambed. Measures to minimize streambank erosion in the temporary channel will be employed.
- Trees and shrubs, when present adjacent to the alignment, will be preserved provided that roadway clear-zone and sight distance requirements are met.

Conclusion

Overall, the Phase 1 Improvements would result in less impervious surface area than the 2006 FEIS Build Alternative. No new significant impacts on water resources would occur as a result of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures would be required. See also Attachment C, Water Resources Technical Memorandum.

4.4 Wetlands

Affected Environment

The wetland impacts by wetland category for the 2006 FEIS Build Alternative was provided in Table 3.3-6 of the FEIS (reproduced below in Exhibit 4.4-1). The wetland boundaries from the 2006 FEIS are shown on Exhibits 4.4-2 and 4.4-3 (reproduction of Figures 3.3-1 and 3.3-2 from the FEIS). These wetlands are described in detail in Section 3.3.2 of the 2006 FEIS.

Exhibit 4.4-1. Wetland Impacts by Category for the 2006 Build Alternative

Wetland Category (Ecology 1993)	Wetland Impacts (acres)	Percent of Total Wetlands Affected
II	0.8	2
III	32.1	98
IV	0.04	<1
Total	32.94	

The wetlands discussion in the 2006 FEIS remains generally applicable to the proposed Phase 1 Improvements. WSDOT Olympic Region Environmental & Hydraulic Services Office (OR EHS) conducted a wetland inventory in 2015 to provide preliminary information to supplement the 2005 Wetlands Discipline Report (WDR) (WSDOT 2005), which served as the basis for the 2006 FEIS. The 2015 inventory identified wetland locations, estimated size, anticipated category, generalized functions, and provided preliminary information regarding anticipated wetland and buffer impacts. The 2015 inventory was reverified by OR EHS in the fall of 2017 to again document conditions and bring existing wetland conditions up to date. Changes in existing conditions for wetlands between 2015 and 2017 were few and generally minor.

The 2015-2017 wetlands inventory and reverification:

- Confirmed wetland presence and approximate boundaries identified in the 2005 WDR where the 2006 FEIS Build Alternative alignment and the proposed SR 167 Project Phase 1 Improvements alignment overlap.
- Identifies potential wetland boundary amendments of delineated wetlands documented in the 2005 WDR.
- Identifies additional wetlands previously unidentified in the 2005 WDR, and occurring in the proposed SR 167 Phase 1 Improvements alignment.
- Omits wetlands identified in the 2005 WDR that are no longer present in the proposed SR 167 Phase 1 alignment, or that have since been determined to be nonjurisdictional wetlands.
- Inventories additional areas for wetlands that were not included in the 2006 FEIS alignment, which are now included in the proposed Phase 1 alignment.
- Updates current potential wetland and buffer impacts based on the 2017 reverification.

Wetlands previously identified in the 2005 WDR were reviewed, and most were retained in the 2015 inventory. Some wetland boundaries were adjusted as an outcome of the 2015 inventory, and some previously identified wetlands were omitted, either as a result of development activities that had occurred in the corridor since the 2005 delineation or because the wetland features had been determined to be nonjurisdictional. Some entirely new wetlands were identified and added in the 2015 inventory. For the 2017 inventory, wetland determinations were made using observable vegetation and

hydrology indicators in accordance with methods described in the Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). Soil pits were not excavated, however, National Resource Conservation Service (NRCS) hydric soil maps were reviewed (NRCS 2017d). Wetland boundaries were estimated based on field observations and background information.

In addition to field observations and documentation in the 2005 WDR, the following data sources were reviewed for information on precipitation, soils, vegetation patterns, potential or known wetlands in the project vicinity, topography, and drainage:

- NRCS Climate Data for Pierce County, Washington (NRCS 2017a)
- NRCS Washington State Hydric Soil list (NRCS 2017b) and map units (NRCS 2017d)
- NRCS official soils series descriptions (NRCS 2017c)
- Aerial photographs (ESRI 2017)
- National Wetland Inventory (NWI) maps (USFWS 1996)
- U.S. Geological Survey (USGS) 7.5 minute topographic maps (USGS 2017)

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) classification system (FGDC 2013) and the Hydro-geomorphic Classification system (HGM) (Brinson 1993). Wetland functions were generally assessed based on the Wetland Functions Characterization Tool for Linear Projects (Null et al. 2000). A more detailed assessment of functions would be conducted prior to SR 167 Completion Project environmental permitting.

Wetland categories in the 2005 WDR were assigned using the Washington State Wetland Rating System for Western Washington - Revised (Hruby 2004) (2004 rating system). Wetland categories were reviewed in 2015, and again during the 2017 field verification. In most cases the rating was assumed to remain unchanged based on field observations, background information, and the methods described in the Washington State Wetland Rating System for Western Washington – 2014 Update (Hruby 2014) (2014 rating system). For the 2017 verification, best professional judgment was used based on the 2014 rating system, field observations, and background information, to assign an assumed wetland category to newly identified wetlands, or wetlands identified in the 2005 WDR where conditions were observed to have changed.

Exhibit 4.4-2. Hylebos Creek Basin Wetland Impacts of 2006 Build Alternative (Figure 3.3-1 of 2006 FEIS)

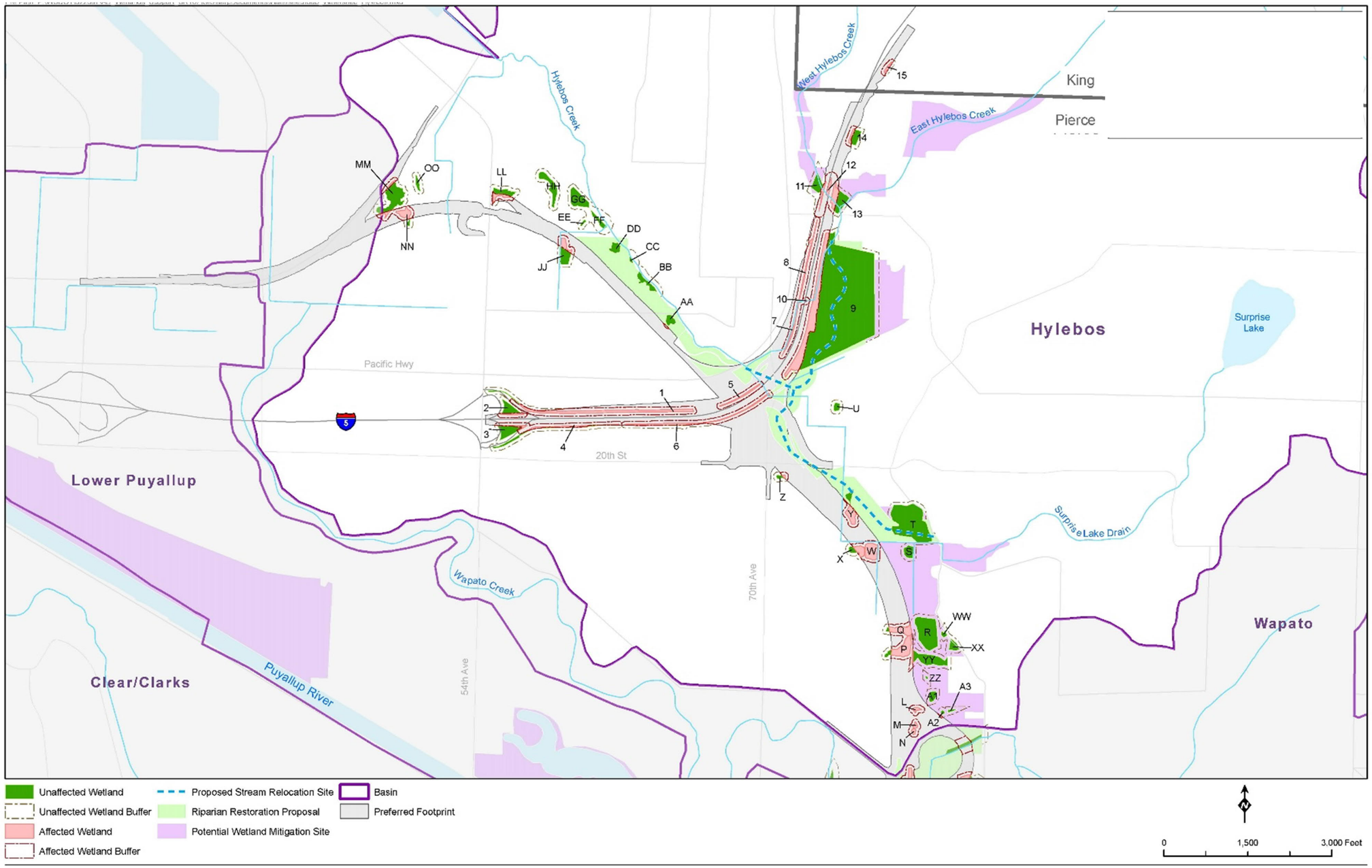
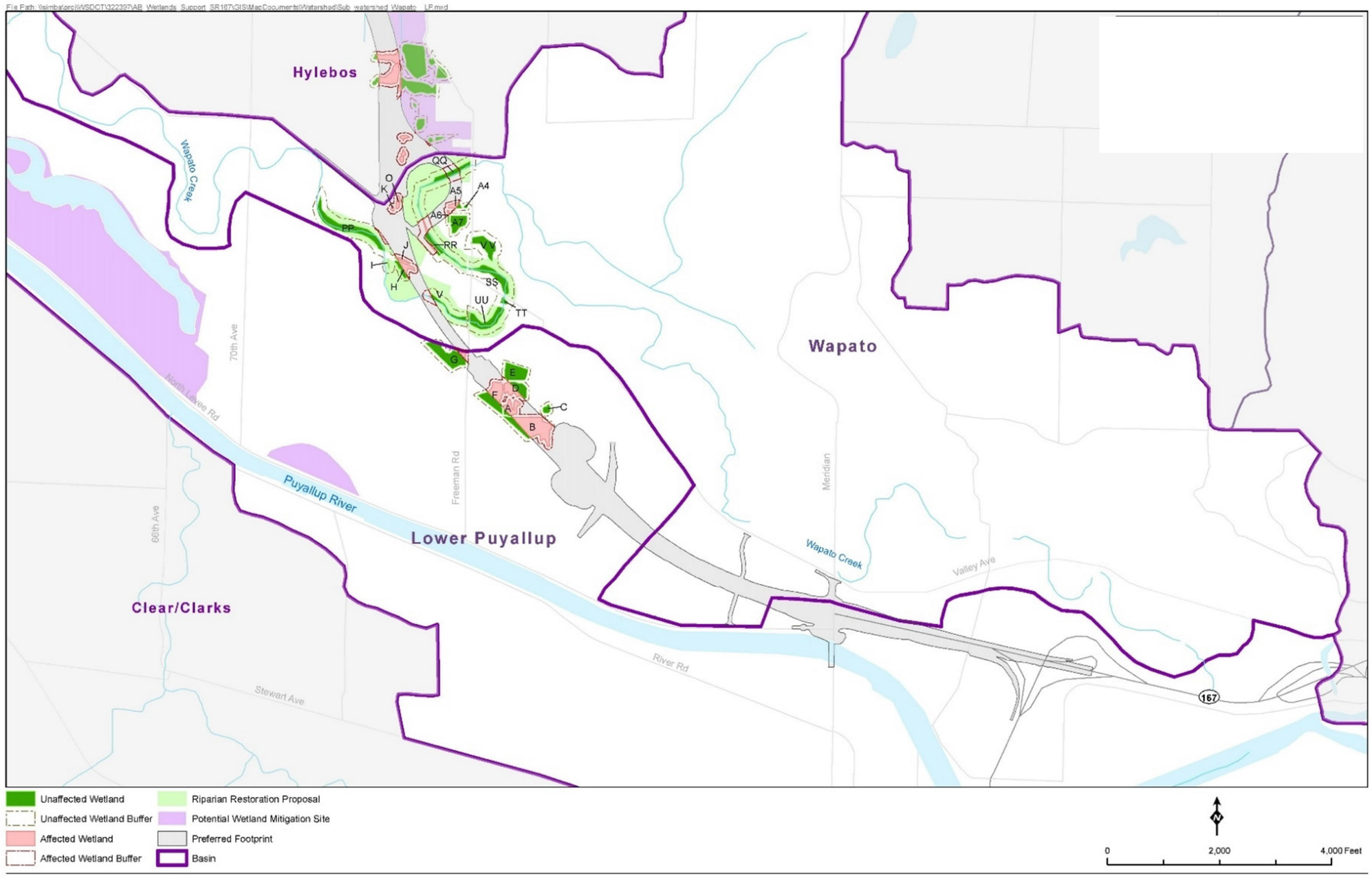


Exhibit 4.4-3. Wapato Creek and Lower Puyallup River Basin Wetland Impacts of 2006 Build Alternative (Figure 3.3-2 of 2006 FEIS)



Regulatory buffer requirements are based on the requirements of local jurisdictions. Buffer requirements for wetlands were identified based on the following local jurisdiction's municipal codes: City of Milton (Milton 2017), City of Fife (Fife 2017), City of Puyallup (Puyallup 2017), and Pierce County (Pierce County 2017). Each of the applicable local jurisdictions codes are based on the 2004 rating system. Tables for converting categories and function scores between the 2004 and 2014 rating systems are available from Ecology (Ecology 2017). Wetland names assigned in the 2005 WDR were retained in this 2017 documentation so that information provided in the 2005 WDR could be referenced for comparison. Newly identified wetlands added to the inventory during 2015 field work are easily distinguishable from wetlands identified in the 2005 WDR by the 2015 prefix included in the wetland name.

If a named wetland letter or number is missing in this report, it is because it has disappeared from the landscape since the 2005 WDR, it does not occur within the new proposed Phase 1 Improvements alignment or has since been determined to be nonjurisdictional.

Exhibit 4.4-4 identifies the wetlands in the Phase 1 Improvements area.

Much of the land use activities influencing the surrounding landscape have resulted in alteration of vegetation, soils, and hydrology including many areas containing fill material and ditches draining water. Vegetation in the project vicinity is largely disturbed. Much of the southern project area is in agricultural production. Remaining vegetated open areas include uplands, wetlands, streams and riparian areas with native trees, shrubs, and herbaceous species, mixed with nonnative and invasive species.

Rapid commercial development was present prior to the 2005 WDR conditions and has steadily continued over the past thirteen years. Many parcels in Fife near and adjacent to the proposed SR 167 Phase 1 Improvements were actively being developed during 2015 field work and as confirmed in 2017, several parcels identified as potential wetland, stream, or riparian restoration in the 2005 WDR have since been developed.

Summary of 2015–2017 Findings

Fifty-three wetlands were identified during the 2015 wetland inventory within the proposed Phase 1 Improvements. This includes 35 wetlands previously identified in the 2005 WDR and 18 additional wetlands added during 2015 field work. Five wetlands were omitted that were previously included in the 2005 WDR. No wetlands were added or subtracted from the 2015 inventory based on the 2017 inventory. Two wetland boundaries (Wetland STW and Wetland Y) were modified in 2017.

Documented conditions of many wetlands identified in the 2005 WDR had little to no observable change during the 2015 wetland inventory field work. When changes to wetlands were evident, they included the following:

- Expanded wetland boundaries.
- A change in vegetation community; generally when agricultural fields were fallowed (temporarily unplowed), vegetation reported as palustrine unconsolidated shore (PUS) in the 2005 WDR had changed to establishing palustrine emergent (PEM), palustrine scrub-shrub (PSS), or young palustrine forested (PFO) communities.
- Additional wetlands previously unidentified, likely because they are either newly formed since the 2005 WDR, were not apparent at the time of the 2005 WDR study or are newly added because they occurred beyond the 2006 FEIS alignment project limits.

Omitted wetlands either are no longer present due to development since 2005 or were determined to be nonjurisdictional by the U.S. Army Corps of Engineers (USACE), Ecology, and local jurisdictions.

Wetlands 10 and 12 were omitted because they were included in (had permitted impacts resulting) from the WSDOT I-5 HOV Port of Tacoma to King County Line project (USACE 2009) completed in May 2012.

Wetland Functions

Wetlands in the project vicinity provide a range of water quality, hydrologic, and habitat functions. Functions for wetlands documented in the 2005 WDR generally remain unchanged.

Wetland Buffers

Wetland buffers in the proposed SR 167 Phase 1 Improvements alignment generally provide little to no buffering function. Many wetlands occur in agricultural fields where buffering functions are not present. Other wetlands abut local surface streets, state routes or interstate highway, or commercial or residential developments, where buffering function is limited to lacking. Wetlands north of I-5 and south of SR 509, occurring adjacent to Hylebos Creek or within its riparian corridor (Wetlands AA through HH) have intact, high functioning buffers along their east side, consisting of mature riparian forested corridor and other wetlands around Hylebos Creek, as well as mature upland forests along steep slopes. Several areas of upland forested habitat around Hylebos Creek are designated biodiversity areas and corridors in the WDFW priority habitats and species program (WDFW 2017b).

Effects during Operation

Potential operational impacts of the proposed SR 167 Project Phase 1 Improvements on wetlands are not meaningfully different and would not exceed those discussed in the 2006 FEIS. Implementation of stormwater BMPs would substantially reduce the potential for operational impacts on wetlands. Such BMPs have evolved since the 2006 FEIS with more relative focus on the use of natural terrain and natural dispersion over stormwater ponds but impacts on wetlands should be similar or less than expected in 2006 (WSDOT 2016).

Operational impacts would be limited to those wetlands located immediately adjacent to roadway sections without stormwater collections or compost-amended fill slopes.

Indirect Wetland Impacts

Potential indirect impacts of the Phase 1 Improvements to wetlands would be the same as those discussed in the 2006 FEIS. The proposed Phase 1 Improvements, by substantially improving travel and accessibility, may serve to accelerate short-term planned development in the vicinity of the new freeway interchanges. Some indirect impacts on wetlands may result, but they are anticipated to be limited, consistent with the 2006 FEIS.

The SR 167 Phase 1 Improvements would provide high quality restoration of streams, riparian wetlands, and riparian uplands from existing habitats that are substantially disturbed and not properly functioning. A substantial increase in wetland area and function is also expected from the riparian restoration of Wapato Creek, Surprise Lake Tributary, and Hylebos Creek. The RRP would convert a substantial area of agricultural land, zoned for industrial and commercial development, into riparian areas and wetlands, which would be protected from development. The RRP remains a project environmental commitment pursuant to the 2006 FEIS and 2007 ROD.

Exhibit 4.4-4. Wetlands in the Phase 1 Improvements Alignment

Wetland[a]	Local Jurisdiction	Wetland Classification				Wetland Size (acres) 2005	Wetland Size (acres) 2015	2015 Local Jurisdiction Buffer Width[d] (feet)
		Cowardin[b]	HGM	Ecology[c] & Local Rating[c] 2005	Ecology[c] & Local Rating[d] 2015			
A	Pierce Co.	PUS	Depressional	III	III	1.2	1.2	50
B	Pierce Co./ Puyallup	PFO/PEM/PUS	Depressional	III	I / III	5.0	12.13	150
C	Puyallup	PFO	Depressional	III	III	0.32	0.32	50
D	Pierce Co.	PUS	Depressional	III	III	2.0	2.0	50
E	Pierce Co.	PUS	Depressional	III	III	2.2	2.01	50
UU	Pierce Co.	PEM	Riverine	II	II	2.3	2.33	100
V	Fife	PEM	Riverine	II	II	0.68	1.55	100
2015 - 1	Fife	PEM	Depressional	N/A	III	N/A	0.39	50
2015 - 2	Fife	PFO	Depressional	N/A	III	N/A	0.75	50
2015 - 3	Fife	PEM	Depressional	N/A	III	N/A	0.11	50
K	Fife	PEM	Depressional	III	III	0.09	0.09	50
O	Fife	PUS	Depressional	III	III	0.28	0.28	50
P	Fife	PFO/PEM	Depressional	III	I / III	1.9	2.82	150
Q	Fife	PFO	Depressional	III	I	1.2	1.2	150
2015 - 4	Fife	PFO/PSS/PEM	Depressional	N/A	III	N/A	6.29	50
S/T/W	Fife	PFO/PSS/PEM	Depressional/riverine	III	II	10.28	24.83	100
2015-5	Fife	PSS/PEM	Depressional	N/A	III	N/A	0.20	50
Y	Fife	PUS	Depressional	III	III	1.4	1.96	50
2015 - 6	Fife	PEM/PUS	Depressional	N/A	III	N/A	0.69	50
2015 - 7	Fife	PEM	Riverine	N/A	IV	N/A	0.56	25
2015 - 8	Fife	PFO/PEM/PUS	Depressional/riverine	N/A	III	N/A	7.26	50
U	Fife	PUS	Depressional	III	III	0.34	0.35	50
2015 - 9	Fife	PEM/PUS	Depressional/riverine	N/A	III	N/A	5.03	50
2015 - 10	Fife	PFO/PEM	Depressional	N/A	III	N/A	0.78	50
2015-17	Fife	PFO/PSS	Depressional	N/A	III	N/A	0.54	50

Exhibit 4.4-4. Wetlands in the Phase 1 Improvements Alignment

Wetland[a]	Local Jurisdiction	Wetland Classification				Wetland Size (acres) 2005	Wetland Size (acres) 2015	2015 Local Jurisdiction Buffer Width[d] (feet)
		Cowardin[b]	HGM	Ecology[c] & Local Rating[c] 2005	Ecology[c] & Local Rating[d] 2015			
2015-18	Fife	PFO/PEM	Depressional	N/A	III	N/A	0.86	50
AA	Pierce Co.	PFO/PEM	Depressional	III	III	0.57	0.57	50
BB	Pierce Co./ Fife	PFO	Riverine	II	II	0.84	0.84	100
CC	Pierce Co.	PFO/PEM	Riverine	III	III	0.13	0.52	50
DD	Pierce Co.	PEM	Depressional	III	III	0.66	0.66	50
EE	Fife	PFO/PEM	Depressional	III	III	0.12	0.37	50
GG	Fife	PFO	Depressional	III	III	1.8	1.80	50
HH	Fife	PFO/PEM	Depressional	III	III	1.5	1.51	50
LL	Fife	PFO	Depressional	III	III	1.2	2.02	50
2015-13	Fife	PFO	Riverine	N/A	III	N/A	1.25	50
2015-14	Fife	PEM	Depressional	N/A	III	N/A	0.30	50
2015-15	Fife	PFO/PEM	Depressional	N/A	III	N/A	0.74	50
1	Fife	PEM	Riverine	III	III	3.2	3.20	50
2	Fife	PEM	Depressional	III	III	1.2	1.25	50
3	Fife	PEM	Depressional	III	III	1.6	1.60	50
4	Fife	PSS/PEM	Riverine	III	III	1.5	1.50	50
5	Pierce Co.	PEM	Riverine	III	III	0.35	0.35	50
2015 – 11	Pierce Co.	PFO	Riverine	N/A	III	N/A	0.07	50
2015 – 12	Pierce Co.	PEM	Depressional	N/A	III	N/A	0.09	50
6	Fife	PEM	Riverine	III	III	1.3	1.30	50
7	Pierce Co.	PEM	Riverine	III	III	0.49	0.92	50
8	Pierce Co./ Milton	PFO/PEM	Depressional/Riverine	III	III	0.49	2.36	50/105
9	Pierce Co./ Milton	PFO/PSS/PEM	Depressional/Riverine	III	II	50+	66.56	100/165
2015-16	Milton	PFO/PEM	Depressional	N/A	II	N/A	4.46	165

Exhibit 4.4-4. Wetlands in the Phase 1 Improvements Alignment

Wetland[a]	Local Jurisdiction	Wetland Classification				Wetland Size (acres) 2005	Wetland Size (acres) 2015	2015 Local Jurisdiction Buffer Width[d] (feet)
		Cowardin[b]	HGM	Ecology[c] & Local Rating[c] 2005	Ecology[c] & Local Rating[d] 2015			
11	Milton	PFO/PSS	Depressional/Riverine	II	II	1.3	3.89	165
13	Milton	PSS/PEM	Depressional/Riverine	III	II	2.22	8.17	165
14	Milton	PSS	Depressional	III	III	0.92	0.92	60
15	Milton	PSS/PEM	Depressional	III	III	0.14	0.14	60

Changes from 2005 to 2015 are bolded. All information is based on review of 2005 WDR documentation, 2015 wetland inventory field work (and subsequent 2017 re-verification).

[a] Wetland identifier - wetland names retained from 2005 WDR, wetlands added to the inventory during 2015 field work have names with a 2015 prefix.

[b] NWI Class based on vegetation: PFO = palustrine forested, PSS = palustrine scrub-shrub, PEM = palustrine emergent, PUS = palustrine unconsolidated shore (for this project PUS = wetlands in active agricultural crop); (FGDC 2013).

[c] Ecology rating (Hruby2004; Hruby 2014). An "N/A" designation indicates the wetland was not identified in the 2005 WDR.

[d] Category and buffer widths from appropriate local ordinances (Pierce County 2017; Milton 2017; Fife 2017; Puyallup 2017). An "N/A" indicates the wetland was previously unidentified in the 2005 WDR. All buffer information is subject to change following future wetland rating.

Exhibit 4.4-5. Wetland and Buffer Impacts by Individual Wetland

Wetland[a]	Cowardin[b]	HGM	ECY[c] & Local[d] Rating 2005	ECY[c] & Local[d] Rating 2015	Wtld Size (ac)	Wetland Impact 2017 (ac)	Wetland Buffer Impact
A	PUS	Depressional	III	III	1.2	0.00	0.00
B	PFO/PEM/PUS	Depressional	III	I / III	12.13	.16	1.81
C	PSS	Depressional	III	III	0.32	0.21	0.39
D	PUS	Depressional	III	III	2.0	0.45	0.45
E	PUS	Depressional	III	III	2.01	1.42	0.58
UU	PEM	Riverine	II	II	2.33	0.62	0.91
V	PEM	Riverine	II	II	1.55	0.00	0.38
2015 - 1	PEM	Depressional	N/A	III	0.39	0.10	0.41
2015 - 2	PFO	Depressional	N/A	III	0.75	0.16	0.38
2015 - 3	PEM	Depressional	N/A	III	0.11	0.11	0.32
K	PEM	Depressional	III	III	0.09	0.03	0.34
O	PUS	Depressional	III	III	0.28	0.28	0.66
P	PFO/PEM	Depressional	III	I / III	2.82	0.85	8.02
Q	PFO	Depressional	III	I	1.2	0.47	1.38
2015 - 4	PFO/PEM	Depressional	N/A	III	6.29	2.53	0.33
S/T/W	PFO/PSS/PEM	Depressional/Riverine	III	II	24.83	7.15	1.59
2015-5	PSS/PEM	Depressional	N/A	III	0.20	0.00	0.00
Y	PUS	Depressional	III	III	1.96	0.92	1.39
2015 - 6	PEM/PUS	Depressional	N/A	III	0.69	0.00	0.00
2015 - 7	PEM	Riverine	N/A	IV	0.56	0.17	0.54
2015 - 8	PFO/PEM/PUS	Depressional/riverine	N/A	III	7.26	0.49	1.32
U	PUS	Depressional	III	III	0.35	0.00	0.00
2015 - 9	PEM/PUS	Depressional/riverine	N/A	III	5.03	0.08	1.03
2015 - 10	PFO/PEM	Depressional	N/A	III	0.78	0.64	0.63
2015-17	PFO/PSS	Depressional	N/A	III	0.54	0.00	0.00
2015-18	PFO/PEM	Depressional	N/A	III	0.86	0.36	0.78
AA	PFO/PEM	Depressional	III	III	0.57	0.00	0.00
BB	PFO	Riverine	II	II	0.84	0.00	0.00

Exhibit 4.4-5. Wetland and Buffer Impacts by Individual Wetland

Wetland[a]	Cowardin[b]	HGM	ECY[c] & Local[d] Rating 2005	ECY[c] & Local[d] Rating 2015	Wtld Size (ac)	Wetland Impact 2017 (ac)	Wetland Buffer Impact
CC	PFO/PEM	Riverine	III	III	0.52	0.00	0.00
DD	PEM	Depressional	III	III	0.66	0.00	0.00
EE	PFO/PEM	Depressional	III	III	0.37	0.19	0.70
GG	PFO	Depressional	III	III	1.8	0.00	0.03
HH	PFO/PEM	Depressional	III	III	1.51	0.26	0.50
LL	PFO	Depressional	III	III	2.02	1.94	2.28
2015-13	PFO	Riverine	N/A	III	1.25	0.00	0.00
2015-14	PEM	Depressional	N/A	III	0.30	0.00	0.00
2015-15	PFO/PEM	Depressional	N/A	III	0.74	0.00	0.00
1	PEM	Riverine	III	III	3.2	0.44	1.67
2	PEM	Depressional	III	III	1.25	0.00	0.00
3	PEM	Depressional	III	III	1.6	0.00	0.00
4	PSS/PEM	Riverine	III	III	1.5	0.00	0.00
5	PEM	Riverine	III	III	0.35	0.08	0.62
2015 - 11	PFO	Riverine	N/A	III	0.07	0.07	0.61
2015 - 12	PEM	Depressional	N/A	III	0.09	0.09	0.61
6	PEM	Riverine	III	III	1.3	0.49	2.40
7	PEM	Riverine	III	III	0.92	0.91	1.91
8	PFO/PEM	Depressional/Riverine	III	III	2.36	0.13	2.93
9	PFO/PSS/PEM	Depressional/Riverine	III	II	66.56	3.03	12.49
2015-16	PFO/PEM	Depressional	N/A	II	4.46	0.00	0.00
11	PFO/PSS	Depressional/Riverine	II	II	3.89	0.00	0.00
13	PSS/PEM	Depressional/Riverine	III	II	8.17	0.00	0.00
14	PSS	Depressional	III	III	0.92	0.00	0.00
15	PSS/PEM	Depressional	III	III	0.14	0.00	0.00
					Total	24.83	50.39

Exhibit 4.4-5. Wetland and Buffer Impacts by Individual Wetland

Wetland[a]	Cowardin[b]	HGM	ECY[c] & Local[d] Rating 2005	ECY[c] & Local[d] Rating 2015	Wtld Size (ac)	Wetland Impact 2017 (ac)	Wetland Buffer Impact

[a] Wetland identifier – Wetland names retained from 2005 WDR, wetlands added to the inventory during 2015 field work have names with a 2015 prefix.

[b] NWI Class based on vegetation: PFO = palustrine forested, PSS = palustrine scrub-shrub, PEM = palustrine emergent, PUS = palustrine unconsolidated shore (for this project PUS = wetlands in active agricultural crop); (Cowardin, Carter, Golet and others 1979).

[c] Ecology rating (Hruby2004; Hruby 2014). An "N/A" designation indicates the wetland was not identified in the 2005 WDR.

[d] Category and buffer widths from appropriate local ordinances (Pierce County 2017; Milton 2017; Fife 2017; Puyallup 2017). An "N/A" indicates the wetland was previously unidentified in the 2005 WDR. All buffer information is subject to change following future wetland rating.

Effects during Construction

The 2015-2017 wetland inventory and analysis suggest that potential wetland impacts from the proposed project would be less than indicated in the 2005 WDR. An estimated decrease from 32.94 acres to 24.83 acres is shown in Exhibit 4.4-6 below. The estimated impact quantity from the 2015 inventory is intended to provide a qualitative update to the 2005 WDR. A summary of estimated wetland buffer impacts, and a detailed account of estimated wetland and buffer impacts by individual wetland is included in Exhibit 4.4-7.

Exhibit 4.4-6. Estimated Permanent Wetland Impact Changes between 2005 WDR and 2017 Survey

Year	Total impacts on Category I Wetlands (acres)	Total impacts on Category II Wetlands (acres)	Total impacts on Category III Wetlands (acres)	Total impacts on Category IV Wetlands (acres)
2005[a]	0.00	0.80	32.10	0.04
2017[b]	1.48	10.80	12.38	0.17
Total permanent wetland impacts 2005: 32.94 acres				
Total permanent wetland impacts 2017: 24.83 acres				

[a] 2005 impact numbers from the 2005 Wetland Discipline Report Table 4-10 (WSDOT 2005).
[b] 2017 impact numbers from 167 Project Plan Sheets (WSDOT 2018; Attachment C)

Wetland buffer impacts shown in Exhibit 4.4-7 were applied based on local jurisdictions municipal code requirements. Where wetland and stream buffers overlap, the buffer is considered wetland buffer.

Exhibit 4.4-7. Wetland Buffer Impact Changes between 2005 WDR and 2017 Survey

Total permanent wetland buffer impacts 2005[a]	58.2 acres
Total permanent wetland buffer impacts 2017[b]	50.39 acres

[a] 2005 impact numbers from the 2005 Wetland Discipline Report page 4-7 (WSDOT 2005).
[b] 2017 impact numbers from 167 Project Plan Sheets (WSDOT 2018; Attachment C).

The qualitative assessment conducted in 2015 and reverified in 2017 suggests that overall wetland acreage in the corridor has increased since 2006. The underlying reason for the increase in overall wetland acreage is not definitively known. However, there have been changes in land use and land ownership in the corridor and related changes to hydrology are likely. Increased commercial development in the lower Puyallup River Valley in areas adjacent to the proposed SR 167 Phase 1 Improvements alignment may be linked to hydrological changes within the corridor. Other changes in land ownership and use may contribute. Several parcels, previously in farmer-owned agriculture, have been transferred into WSDOT ownership during earlier phase of project development. This transition undoubtedly involved changes in land use practices, and farmers may have been historically managing land to achieve optimum drainage for agricultural purposes. A less aggressive approach to drainage under WSDOT ownership could have precipitated an increase in hydrologic pressure on fallowed (temporarily unplowed) land.

Despite an apparent overall increase in wetland acreage in the project vicinity, again, current analysis indicates potential impacts would be lower currently than in 2006. This is attributed to the scaled back and smaller footprint of the Phase 1 Improvements.

The temporary construction effects discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter

duration than the 2006 Build Alternative. As discussed in Section 3.3.3 of the 2006 FEIS, temporary wetland disturbances are mainly those that would be necessary for implementing the stream relocation and restoration of wetlands within the riparian restoration areas.

Mitigation

Wetlands and aquatic sites are protected under Presidential Executive Order 11990, Protection of Wetlands (President of the United States 1977); the Governor's Executive Order EO 89-10, Protection of Wetlands (Governor of the State of Washington 1989); and WSDOT Policy Statement 2038.00. These orders and directives require the use of all practicable measures to avoid impacts and provide mitigation for any avoidable impacts. As similarly described in the 2006 FEIS, the executive orders stipulate that all state agencies shall use the following definition of mitigation, and in the following order of preference:

1. Avoid
2. Minimize
3. Rectify
4. Reduce impact over time
5. Compensation including the purchase of credits from a mitigation bank or in-lieu-fee (ILF) program.
6. Monitoring the impact and compensation and taking corrective measures.

The 2006 FEIS further describes the likely wetland mitigation ratios to be applied, types of mitigation that could be conducted, and includes a list of potential mitigation sites where mitigation could be performed. Although the ultimate wetland mitigation solutions to be implemented for this project may not differ meaningfully from those proposed in 2006, there have been a number of changes in wetland regulatory context and guidance since 2006.

In 2008, USACE and U.S. Environmental Protection Agency (EPA) published a document known as the 2008 Federal Rule. Section 332.3(b) describes the preferred measures for compensatory mitigation that this project would be expected to follow:

1. Mitigation bank credits
2. ILF program credits
3. Permittee-responsible mitigation under a watershed approach
4. Permittee-responsible mitigation through onsite and in-kind mitigation
5. Permittee-responsible mitigation through off-site and/or out-of-kind mitigation

Given these mitigation preferences, and the absence of a mitigation bank or ILF program in the area, Permittee Responsible Under a Watershed Approach would be the next preferred option following the guidance provided in the 2008 document Selecting Wetland Mitigation Sites Using a Watershed Approach (Ecology 2008). Guidance on wetland mitigation ratios and other mitigation implementation elements would be applied using Wetland Mitigation in Washington State, Version 1, a two-part interagency document providing guidance on wetland mitigation (USACE and Ecology 2006).

A wetland mitigation strategy for the Phase 1 Improvements has been developed. As part of that effort, the list of potential mitigation sites included in the 2006 FEIS was thoroughly reevaluated. A similar but shorter list of mitigation sites was considered for the new proposed Phase 1 Improvements. Some of the sites identified in 2006 are no longer be available and/or viable mitigation areas. An overall wetland mitigation solution for Phase 1 would be possible even with a subset of the 2006 sites since the overall mitigation requirement is considerably less than reported in the 2006 FEIS.

Environmental Commitments

There are a number of wetland-related commitments included in the 2006 FEIS and associated 2007 ROD that still apply (or apply with slight modification consistent with current standards) to the Phase 1 Improvements.

Avoidance and Minimization: Potential opportunities to incorporate additional avoidance and minimization include (but are not limited to):

- Making minor changes to the design alignment.
- Using steeper fill slopes.
- Using retaining walls to eliminate fill slopes.
- Retain hydrologic connection between wetlands bisected by the highway.

Wetland Delineations:

- Before initial permitting or preparing a final wetland mitigation plan, WSDOT intends to delineate and categorize all wetlands affected by this project.

Final Wetland Mitigation Plan:

- A final wetland and stream mitigation plan will be developed for this project. Mitigation for unavoidable wetland and wetland buffer impacts resulting from the 167 Phase 1 Improvements will be fully mitigated in accordance with applicable federal, state, and local regulatory requirements.

The mitigation strategy accommodates all wetland impacts associated with the Phase 1 Improvements; however, additional mitigation to compensate for buffer impacts in accordance with local Critical Areas Ordinances may be needed. Additional buffer mitigation would be negotiated with local jurisdictions at the time of permitting.

Conclusion

Although changes in the SR 167 Completion Project's corridor such as the fallowing of some agricultural lands, increased impervious surface, and other factors seem to have contributed to a net increase in wetland area, the expected wetland impact acreage of the proposed Phase 1 Improvements would be less than the 2006 FEIS Build Alternative. This is due to the relatively smaller footprint of the Phase 1 design. Correspondingly, the mitigation requirement for the Phase 1 Improvements are anticipated to be lower than that of the 2006 FEIS Build Alternative, with further details to be included in a subsequent Compensatory Mitigation Proposal. There are no new significant impacts associated with agricultural lands as compared to the FEIS. See also Attachment D, Wetlands Technical Memorandum.

4.5 Wildlife, Fish, Vegetation, and Threatened and Endangered Species

Affected Environment

For this Re-evaluation, the 2005 Wildlife, Fish, and Threatened and Endangered Species Discipline Report and the 2006 FEIS were reviewed to determine if they adequately analyzed the new proposed Phase 1 Improvements alignment and ROW, and possible impacts on wildlife, fish, vegetation, threatened and endangered species, habitat and habitat connectivity. WSDOT also reviewed the habitat connectivity section of the 2005 report to determine if it remained applicable for the proposed Phase 1 Improvements alignment.

Wildlife and Wildlife Connectivity

The following changes have occurred since 2006. There have been minor changes to the typical assemblage of bird species known or presumed to use the analysis area since the completion of the 2006 FEIS. The USFWS offers a more recent on-line system for assessing listed species and migratory birds within a defined area called "Information for Planning and Consultation" (IPaC). IPaC was consulted for this assessment (IPaC 2018) and returned a list of thirteen migratory birds of conservation concern that could occur in the proposed Phase 1 Improvements area. Eight of these birds were not evaluated in the WSDOT 2005 Report or 2006 FEIS. The eight new species are:

- Red-throated loon
- Long-billed curlew
- Golden eagle
- Marbled godwit
- Semipalmated sandpiper
- Black turnstone
- Whimbrel
- Clark's grebe

However, records for these species were checked through eBird (2018), an online tool managed by the Cornell Lab of Ornithology, and it was determined that none of the additional bird species identified by the USFWS as migratory species of concern breed in the proposed Phase 1 Improvements area.

Subsequent to 2006, wildlife connectivity within the project area has been addressed in the following ways:

- All stream crossing structures will be designed to allow for fish passage, according to the latest WDFW design criteria (Barnard et al. 2013), which is now required for all projects with applicable crossings of fish-bearing streams. Seven new crossing structures will provide full fish passage and seven additional crossings will be widened or replaced by the proposed Phase 1 Improvements. These structures will allow for continued fish passage on stream segments that formerly did not have structures. Since stream simulation requires the use of wider structures to allow for channel migration within the floodplain (and the structures are often taller as well), the new structures also provide additional movement opportunities for terrestrial wildlife under roads.
- The Riparian Restoration Program (RRP), a unique feature of the SR 167 project, will improve wildlife habitat connectivity along some of the last remaining natural habitats in the proposed Phase 1 Improvements area; 8,880 feet of stream in the Hylebos basin will be restored and

relocated and an additional 5,100 feet of stream in two basins will be restored but not relocated. Additionally, 110 acres of riparian buffer restoration will occur in two basins. Although there will be temporary impacts on wildlife movement during construction, these riparian habitats will likely become the primary wildlife movement corridors in this rapidly urbanizing landscape.

- In accordance with SR 167 project environmental commitments to use all practicable means to minimize impacts to wildlife habitats, existing at-grade movement corridors for terrestrial wildlife will be maintained under the proposed Phase 1 Improvements by elevating some of the new highway sections. Examples are in the area where there is currently no highway on the north side of the Puyallup River, and terrestrial wildlife are able to access the river without encountering a highway barrier. Placement of the new SR 167 corridor on the north side of the river will partially block movement, but elevated highway sections at SR 167/Valley interchange and the SR 167/SR 161 interchange will allow wildlife permeability through SR 167. This elevated section will help maintain an important permeable riparian zone for terrestrial wildlife movements along Wapato Creek. The mainline of SR 167 will also be elevated over SR 161 (North Meridian). The interchange will be just north of the Puyallup River and is in an already developed area, especially to the east. There is more agricultural land to the west of this interchange, but much of this area has been converted to warehouses and is not anticipated to be an important wildlife area.
- A second group of elevated structures would occur in several locations where there are existing local roads/state highways. By elevating the new project roadway segments over the existing roads, there would, consistent with SR 167 project commitments, be no additional blockages to wildlife movement, although increased noise may alter wildlife behavior in these areas. Elevated sections of new roadway over existing roadway will occur in the lower Hylebos area west of I-5; the new SR 509 spur would be elevated over SR 509, 54th Avenue, and 12th Street E, and SR 167 would be elevated over SR 99. In the area east of I-5, SR 167 would be elevated over 20th Street E and 26th Street E.

I-5 at the proposed SR 167 intersection remains a major barrier to east-west wildlife movement, with the paved highway about 170 feet wide. There will be no work to change the profile of I-5, but culverts under I-5 on Hylebos Creek will be widened for fish passage. These wider structures should also provide at least seasonal passage for terrestrial wildlife species and improve wildlife permeability through I-5.

Federal Threatened and Endangered Species

In the 2006 FEIS, Table 3.4-10 (page 3-186) provided the Determination of Effects on Threatened and Endangered Species, showing Endangered Species Act (ESA)-listed species and critical habitat, and preliminary effect determinations for the 2006 Build Alternative. Exhibit 4.5-1 (below) includes these same listed species and critical habitat, and updated information (2018) comparing the effects of the proposed (2018) Phase 1 Improvements.

Exhibit 4.5-1. Threatened and Endangered Species Evaluated under the Endangered Species Act: Comparison – 2006 FEIS and 2018 Phase 1 Improvements

Species/Habitat	Federal Status (2006 FEIS)	Effect Determination	Federal Status (2018 Phase 1 Improvements)	Effect Determination
Bald Eagle	Threatened	NLTAA	Removed from ESA Listing	N/A
Marsh Sandwort	Endangered	NE	Endangered	NE
Golden Paintbrush	Threatened	NE	Threatened	NE
Water Howellia	Threatened	NE	Threatened	NE
Chinook salmon	Threatened	LTAA	Threatened	LTAA

Exhibit 4.5-1. Threatened and Endangered Species Evaluated under the Endangered Species Act: Comparison – 2006 FEIS and 2018 Phase 1 Improvements

Species/Habitat	Federal Status (2006 FEIS)	Effect Determination	Federal Status (2018 Phase 1 Improvements)	Effect Determination
Chinook salmon critical habitat	Proposed	LTAA	Threatened	LTAA
Bull Trout	Threatened	LTAA	Threatened	LTAA
Bull Trout critical habitat	Proposed	LTAA	Threatened	LTAA

NE = No Effect; LTAA = Likely to Adversely Affect; NLTAA = Not Likely to Adversely Affect; N/A = Not Applicable
NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service
Bold text indicates changes since 2006.
Sources: 2006 FEIS; April 18, 2018 ESA Section 7 Formal Re-initiation to NMFS, and April 18, 2018 Draft ESA Section 7 Formal Update to USFWS.

As shown in Exhibit 4.5-1, subsequent to issuance of the 2006 FEIS, both the proposed Bull Trout critical habitat and the designated Chinook Salmon critical habitat were listed under Section 7 of the Endangered Species Act.

Exhibit 4.5-2 (below) includes information prepared for a pre-Biological Assessment meeting (December 2017) with the Federal Services and provides a comprehensive summary of ESA effect determinations and species status within the SR 167 Phase 1 Improvements study area.

Exhibit 4.5-2. Species/Critical Habitat Addressed in ESA Consultation(s) and Associated Effect Determinations

Species	Federal Status	Effect Determination[a]
PS Chinook	Threatened 1999, 2005, April 2014	LTAA – 2007, 2013, 2018 - no change
PS Chinook CH	Designated September 2005	LTAA – 2007, 2013, 2018 - no change
PS steelhead	Threatened in 2007, April 2014	LTAA – 2013, 2018 - no change
PS steelhead CH	Designated February 2016	NLTAA – 2018
Eulachon	Threatened in March 2010	NLTAA – 2013, 2018 - no change
Eulachon CH	Designated October 2011	NE – 2013, 2018 - no change
Bull trout	Threatened November 1999	LTAA – 2007, 2012, 2018 - no change
Bull trout CH	Designated 2005, January 2010	LTAA – 2007, 2012, 2018 - no change
Bald Eagle	Threatened (2007 consultation), Delisted	NLTAA – 2007, 2018 – delisted
Marbled Murrelet	Threatened 1992, January 2010	NE – 2007, 2018 - no change
Marbled Murrelet CH	Designated 1996, 2006, 2011, August 2016	NE – 2007, 2018 - no change
Northern Spotted Owl	Threatened 1990	NE – 2007, 2018 - no change
Northern Spotted Owl CH	Designated 1992, June 2012	NE – 2007, 2018 - no change
Gray Wolf	Endangered March 1978	NE – 2007, 2018 - no change
Grizzly Bear	Threatened July 1978	NE – 2007, 2018 - no change
Canada Lynx	Threatened March 2000	NE – 2007, 2018 - no change
Marsh Sandwort	Endangered August 1993	NE – 2007, 2018 - no change
Golden Paintbrush	Threatened June 1997	NE – 2007, 2018 - no change
Water Howellia	Threatened July 1994	NE – 2007, 2018 - no change

Exhibit 4.5-2. Species/Critical Habitat Addressed in ESA Consultation(s) and Associated Effect Determinations

Species	Federal Status	Effect Determination[a]
Mazama Pocket Gopher	Candidate (2007 consultation), Threatened in April 2014.	No impact on individuals, populations or suitable habitat – 2007, 2018 – NE
Mazama Pocket Gopher CH	Designated April 2014	NE – 2018
Oregon Spotted Frog	Candidate (2007 consultation), Threatened August 2014.	No impact on individuals, populations or suitable habitat – 2007, 2018 – NE
Oregon Spotted Frog CH	Designated May 2016	NE – 2018
Taylors' checkerspot butterfly	Candidate (2007 consultation), Endangered October 2013.	No impact on individuals, populations or suitable habitat – 2007, 2018- NE
Taylors' checkerspot butterfly CH	Designated October 2013	NE – 2018
Streaked horned lark	Candidate (2007 consultation), Threatened in October 2013.	Not likely to impact individuals, populations or suitable habitat – 2007, 2018 – NE
Streaked horned lark CH	Designated October 2013	NE – 2018
Yellow-billed cuckoo	Candidate (2007 consultation), Threatened in October 2013.	No impact on individuals, populations or suitable habitat – 2007, 2018 – NE
Yellow-billed cuckoo CH	Proposed	No impact on proposed CH – 2018
Mardon Skipper	Candidate	No impact on populations, individuals or suitable habitat – 2007, 2018 - no change

PS = Puget Sound, LTAA = likely to adversely affect, NLTAA = not likely to adversely affect, NE = no effect, CH = critical habitat.

This exhibit lists the species addressed in consultations, federal status, and effect determinations (2007, 2013), as well the Phase [a] Source: 10/11/18 email from HNTB's Julie Hampden to Daniel Babuca.

Since 2006, WSDOT and FHWA have continued ESA consultation with the Federal Services. On September 21, 2007, NMFS issued a Biological Opinion (BO), and on February 7, 2013, NMFS issued a Re-initiation BO. The first re-initiation for the overall SR 167 project was conducted to address replacement of the SR 167 Puyallup River Bridge and to consult on Puget Sound steelhead and Pacific eulachon, which were not listed at the time of the original 2007 consultation.

On April 18, 2018, WSDOT and FHWA submitted a request for ESA Section 7 Formal Re-initiation to the NMFS (NMFS Tracking No. 2005/05617, 2012/03666). Consultation was completed with receipt of NMFS' concurrence on October 1, 2018 (WCR-2018-9460). On November 9, 2018, WSDOT and FHWA submitted an ESA Section 7 Update to the USFWS (USFWS Reference No. 1-3-05-F-0688). Consultation was completed upon receipt of USFWS' acknowledgement and addition of the Update to the administrative record on December 10, 2018 (Tracking No. 13410-2005-F-0008).

Three additional fish and/or critical habitat listings have occurred since the completion of the 2006 FEIS. These include Puget Sound steelhead, Puget Sound steelhead critical habitat and Puget Sound bull trout critical habitat. Although an additional fish species has been listed and two fish critical habitats have been designated, the Phase 1 Improvements reduce impacts on aquatic listed species and critical habitats.

The 2006 FEIS determined that although marbled murrelets are known to use areas of South Puget Sound for foraging and past breeding evidence has been recorded in eastern Pierce County; however, only marginally suitable foraging habitat occurs in Commencement Bay, and marbled murrelets were not expected to forage within the project area, and there was no suitable nesting habitat in the study

area or documented sightings. The findings of the Wildlife, Fish, Vegetation, and Threatened and Endangered Species Technical Memorandum (WSDOT 2018) confirmed this finding.

Since the original 2007 consultation, USFWS listed several new species, including Mazama pocket gopher, yellow-billed cuckoo, and streaked horned lark, which had potential to exist in the project area. However, subsequent studies (summarized in WSDOT 2018) including review of the USFWS IPaC system, found no suitable habitat for these species within the proposed Phase 1 Improvements project vicinity.

Fish

Implementation of the proposed Phase 1 Improvements would substantially decrease the overall impacts on fish in the project area in comparison to the impacts of the 2006 FEIS Build Alternative. All temporary stream crossings would be eliminated, the number of new stream crossings would be reduced and additional stream crossings would be removed or improved for fish passage. Since the 2006 FEIS, WDFW has developed new water-crossing design criteria for fish-bearing streams. As a result, any culverts that would be replaced for fish passage must now meet strict fish passage criteria (Barnard et al. 2013). Because all WSDOT projects are required to meet these new criteria, the majority of water crossings would be substantially wider structures (i.e., bridges). The proposed Phase 1 Improvements would create and/or restore approximately 2.6 miles of stream habitat, 110 acres of riparian buffer and reduce pollution generating impervious surface, compared to the 2006 FEIS Build Alternative.

Stormwater pollutants also present risks to fish and their habitats. There is considerably less pollution generating impervious surface (PGIS) under the proposed Phase 1 Improvements alignment (75.6 acres new PGIS), when compared to the 2006 FEIS alignment (258 acres new PGIS). This would result in lower pollutant loads discharged into project area surface waters.

Riparian Restoration Program

The RRP remains an integral part of the proposed Phase 1 Improvements. The RRP would serve as an alternative to conventional stormwater flow control BMPs, would have multiple wetland mitigation sites nested within the riparian corridors, and would enhance wildlife movement corridors within the project area. The 2006 FEIS outlined RRP elements in three basins: Hylebos, Surprise Lake, and Wapato.

The RRP would continue to provide many important benefits to wildlife, including enhancing hydrologic connectivity of floodplain wetlands with stream channels, improving habitat features in streams by placement of large woody debris, removal of fish barriers, new or improved stream crossings, removal of stream crossings no longer needed, and removal of invasive vegetation species and replacement with native species. There are some changes in the RRP under the Phase 1 Improvements, mostly in the Wapato basin. The Wapato RRP strategy includes revegetation of the stream banks and riparian areas, but no relocation of the Wapato stream channel.

The proposed Phase 1 Improvements would reduce impacts compared to the 2006 FEIS Build Alternative, by eliminating all temporary stream crossings, which reduces potential for sedimentation. Fewer new stream crossings also reduces overall additional impacts on the fishery resource. There would also be new temporary impacts that were not described in the 2006 FEIS, when the existing Hylebos I-5 bridges are widened during construction of the new I-5 Hylebos bridges. Temporary impacts would include additional downstream sedimentation, and temporary loss of aquatic and terrestrial wildlife connectivity through the existing structures during construction. The new structures would provide for additional aquatic and terrestrial wildlife connectivity under I-5 as previously stated.

Vegetation

The Phase 1 Improvements would result in less permanent vegetation impact, 110 acres, as compared to the 217 acres under the 2006 Build Alternative. However, the Phase 1 Improvements would result in more temporary impact: 141 acres, versus 92 acres. The temporary impacts would increase under the Phase 1 Improvements primarily because of additional riparian restoration planned in the Hylebos basin.

Effects during Operation

Consistent with the operational impacts on wildlife and aquatic resources identified in the 2006 FEIS for the Build Alternative, the Phase 1 Improvements would result in:

- Direct loss of wildlife due to wildlife-vehicle collisions.
- Higher levels of noise and light emanating from the highway, both of which can affect wildlife through displacement and altered behaviors, leading to lower fitness.
- An increase in pollutants from the new roadway. Although the stormwater from the new impervious surface would be treated, there would be increased pollutant loads into surface waters.
- Reduced wildlife habitat connectivity in parts of the project area due to the barrier effect of the new road, which would be partially offset by the enhancement of forested riparian corridors, wetland restoration, elevated sections of the roadway that are permeable to wildlife, installation of new fish passable structures and replacement of fish barrier culverts.
- Benefits associated with the RRP for both aquatic and terrestrial wildlife from establishment/reestablishment of riparian buffers along 4.4 miles of stream channel, and restoration/enhancement of 189 acres of wildlife habitat.

Operational impacts under the Phase 1 Improvements are anticipated to be less than those described in the 2006 FEIS because the reduced project footprint would result in lower traffic levels, with less noise and light from the roadway. Wildlife/vehicle collisions may or may not decrease. The new highway would likely be a barrier to movement for small and medium-sized animals regardless if it is four (proposed Phase 1) or six lanes (2006 FEIS Build Alternative). It may also be a partial barrier to larger mammals (deer, coyote) regardless of the differences in width.

Pollutant loads resulting from the proposed Phase 1 Improvements would be less than described in the 2006 FEIS. The Phase 1 Improvements would result in 76 acres of new PGIS, compared to 258 acres under the 2006 FEIS Build Alternative. The need to treat stormwater from less pollution generating impervious surface in Phase 1 would result in fewer or reduced sized stormwater features and BMPs, and lower pollutant loads into impacted surface waters.

Wildlife connectivity and habitat improvements resulting from Phase 1 Improvements would be similar to what was described in the 2006 FEIS, primarily because the RRP would only have minor changes. The wildlife benefits associated with the RRP described in the 2006 FEIS would also be realized as a result of the Phase 1 Improvements.

Effects during Construction

The 2006 FEIS Build Alternative included 11 temporary stream crossings for construction. All temporary stream crossing would be eliminated in the proposed Phase 1 Improvements. The elimination of temporary stream crossings would substantially reduce the potential of sedimentation and turbidity impacts within the Hylebos, Surprise Lake Tributary, and Wapato watersheds.

Temporary vegetation impacts for the proposed Phase 1 Improvements were calculated based on a 40-foot buffer around a 10-foot offset from the cut and fill line. Cut and fill slope vegetation impacts are considered permanent, although they would be revegetated. Temporary impacts also include the entire RRP area, including 133.0 acres in the Hylebos sub-basin and 7.7 acres in the Wapato sub-basin. Temporary vegetation impact areas include temporary access roads and staging areas, which are revegetated when work is completed at the site. These are worst case estimates based on preliminary project design and would likely be reduced as the project advances toward final design. Consistent with the 2006 FEIS, revegetated areas of the Phase 1 Improvements would be replanted with native species. Many of the projected disturbance areas currently are covered in invasive species, with reed canary grass common in both the Hylebos and Surprise Lake basins. Temporary impacts on vegetation under the proposed Phase 1 Improvements (141 acres) are anticipated to be greater than impacts from the 2006 FEIS (41 acres), primarily due to planned additional restoration work in the Hylebos drainage.

Mitigation

The mitigation measures as described in Section 3.4.10 of the 2006 FEIS and 2007 ROD remain applicable to the proposed Phase 1 Improvements. These will include additional design refinements to minimize impacts, mitigation for wetland impacts, using fish passable structures, and implementing the RRP. All applicable laws will be considered and complied with as design progresses, and during project construction. FHWA and WSDOT will apply the minimization measures and performance standards resulting from the Biological Assessment (BA) and comply with all Terms and Conditions resulting from ongoing consultation and approval from the USFWS and NMFS.

Pursuant to 2007 ROD commitments, preconstruction monitoring for migratory birds will be conducted by WSDOT. Since issuance of the 2006 FEIS, WSDOT has worked with the U.S. Fish and Wildlife Service Migratory Bird Treaty (USFWS MBTA) Office and has completed a “Bird Conservation Plan” (WSDOT 2016), with approval by the USFWS MBTA Office. The primary objective of the Bird Conservation Plan is to determine appropriate project-specific methods to avoid and minimize project effects to nesting birds. Although incidental take is no longer a focus of USFWS enforcement of the MBTA, WSDOT will continue to promote the goal of minimal impacts on nesting birds through the use of the Bird Conservation Plan.

Conclusion

Compared to the 2006 FEIS Build Alternative, the proposed Phase 1 Improvements would decrease the impacts on agricultural land, marginal forest and grass/scrub/shrub habitat types and lessen impacts on existing developed areas. The Phase 1 Improvements would reduce the overall impacts on the fisheries resource due to a reduction in overall in-water work (i.e., fewer stream crossings). The Phase 1 Improvements would not alter the conclusion of the 2006 FEIS that the SR 167 Completion Project would not result in any new significant impacts to fish and wildlife, vegetation, or threatened and endangered species. Consistent with the 2006 FEIS, overall habitat connectivity is expected to be minimally degraded between the remaining forested habitats due to the relative location of these habitats to the proposed Phase 1 Improvements but would be improved in some areas with the removal of several undersized crossings, using up-to-date fish passage criteria for all new or replaced crossings, and implementation of the RRP.

The design modifications for the proposed Phase 1 Improvements are consistent with the extent of impacts identified in the 2006 FEIS. No additional adverse effects to fish and wildlife, vegetation, threatened and endangered species would result from the Phase 1 Improvements. See also Attachment E, Wildlife, Fish, Vegetation, and Threatened and Endangered Species Technical Memorandum.

4.6 Air Quality

Affected Environment

The affected environment relative to air quality as described in Chapter 3.5 of the 2006 FEIS remains generally applicable to the proposed Phase 1 Improvements. However, certain aspects have changed since 2006 as described below.

Criteria Pollutants

Under the authority of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) has identified several air pollutants as pollutants of concern nationwide and has established the National Ambient Air Quality Standards (NAAQS). These pollutants, known as criteria pollutants, are carbon monoxide (CO), particulate matter with a diameter of 10 micrometers or less (PM_{10}), particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). The NAAQS specify maximum allowable concentrations for these criteria pollutants. Areas that meet the NAAQS are deemed attainment areas. Areas not in compliance with the NAAQS are deemed nonattainment areas. Areas that were formerly classified as nonattainment areas but have since demonstrated attainment with the NAAQS are classified as maintenance areas.

The SR 167 Completion Project area is currently designated as a maintenance area for PM2.5 and PM10, and in attainment for all of the other criteria pollutants (CO, SO_2, NO_2, O3, and Pb).

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (https://www.epa.gov/iris). In addition, EPA identified the following nine compounds with substantial contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA): Benzene, Acrolein, Formaldehyde, Acetaldehyde, Ethylbenzene, 1,3-butadiene, Diesel exhaust, Naphthalene, and Polycyclic Organic Matter (POM). The 2007 EPA rule described above requires controls that would dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Pursuant to the new regional travel demand model network that was developed for this (2017) air quality analysis, the SR 167 Completion Project would have less than 140,000 AADT; therefore, it would qualify as a project with low potential MSAT effects. For these projects, a qualitative assessment of emissions projections is recommended; however, because a regional analysis for criteria pollutants is being completed, WSDOT decided to complete a quantitative regional MSAT analysis as well.

Regional Modeling

As mentioned, the SR 167 Completion Project area is currently classified as a maintenance area for both PM_{10} and $PM_{2.5}$. In 2009, EPA classified the Tacoma-Pierce County area a nonattainment area because fine particle ($PM_{2.5}$) pollution levels exceeded air quality standards from 2006 to 2008. On February 10, 2015, EPA redesignated the Tacoma-Pierce County nonattainment area to attainment and approved the revision to the State Implementation Plan and associated maintenance plan. Since the area is currently a maintenance area for both $PM_{2.5}$ and PM_{10}, it must be determined if the project is one of air quality concern.

The project has gone through the required interagency coordination process to determine if it is a project of air quality concern. The interagency Air Quality Consultation partners consist of representatives from EPA, FHWA, Puget Sound Regional Council (PSRC), Puget Sound Clean Air Agency (PSCAA), FTA and Ecology. On December 19, 2017, WSDOT held a conference call with PSRC, EPA, FHWA, and FTA to discuss the project. In March 2018, all partners (PSRC, EPA, FHWA, FTA, PSCAA, and Ecology) confirmed via email that they support the determination that this project is not one of air quality concern and no hot-spot analysis is required.

Effects during Operation

Criteria Pollutants

Regional criteria pollutants were analyzed for the Existing Conditions, the No Build condition and the proposed Phase 1 Improvements (Build Alternative). As shown in Exhibit 4.6-1, both the No Build condition and the Phase 1 Build Alternative are expected to increase average daily vehicle miles traveled (VMT) and decrease regional pollutant emissions by 10 to 87 percent, as compared to the Existing Conditions. The Build Alternative is expected to increase average daily VMT by 1 percent and increase regional pollutant emissions by 1.0 to 14 percent, as compared to the No Build condition. Although the regional emissions due to the Build Alternative would be greater than emissions from the No Build, there would be a substantial decrease from Existing Conditions, and concentrations of criteria pollutants would continue to be below the NAAQS. As such, the Phase 1 Improvements are predicted to have no meaningful effect on regional pollutant burden levels.

Exhibit 4.6-1. Regional Criteria Pollutant Emission Assessment

Alternative	Average Yearly Vehicle Miles Traveled	Pollutant (tons per year)				
		CO	NOx	PM10	PM2.5	SO2
Existing Conditions	18,470,785,650	86,321	19,922	1,571	701	165
2045 No Build	22,334,511,000	27,830	2,609	1,238	247	118
Percent change—No Build compared to Existing Conditions	21%	-68%	-87%	-21%	-65%	-29%
2045 Build	22,453,605,000	28,328	2,644	1,407	270	123
Percent change—Build compared to Existing Conditions	22%	-67%	-87%	-10%	-61%	-25%
Percent change—Build compared to No Build	1%	2%	1%	14%	10%	4%

MSAT Analysis

A regional MSAT analysis was conducted for Existing Conditions, the No Build condition and the Phase 1 Improvements (Build Alternative). As shown in Exhibit 4.6-2, the 2007 EPA rule requires controls that would dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Although Existing average yearly VMT is predicted to increase by over 20 percent, No Build and Build MSAT emissions are predicted to decrease by 54 to 99 percent. Compared to the No Build condition, the Build Alternative is expected to increase average daily VMT by 1 percent, and MSAT emissions would increase by 0 to 15 percent. Although the MSAT emissions due to the Build Alternative would be greater than the No Build, the magnitude of reductions from cleaner engines and fuels is so great that MSAT emissions in the study area would be lower in the future for both alternatives. As such, the Build Alternative is predicted to have no meaningful effect on regional pollutant burden levels.

Exhibit 4.6-2. Regional MSAT Emission Assessment

Alternative	Average Yearly Vehicle Miles Traveled	Pollutant (tons per year)								
		1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	POM
Existing Conditions	18,470,785,650	11	55	6	121	631	79	95	12	5
2045 No Build	22,334,511,000	0.05	9	1	32	228	35	23	2	1
Percent change No Build compared to Existing Conditions	21%	99.95%	-84%	-83%	-74%	-64%	-56%	-75%	-81%	-86%
2045 Build	22,453,605,000	0.05	10	1	34	263	36	25	2	1
Percent change Build compared to Existing Conditions	22%	99.95%	-83%	-83%	-72%	-58%	-54%	-74%	-81%	-86%
Percent change Build compared to No Build	1%	0%	7%	0%	5%	15%	3%	7%	7%	4%

Effects during Construction

Phase 1 Improvements would not result in any new temporary construction effects as compared to the 2006 FEIS Build Alternative. Air quality impacts during construction of Phase 1 Improvements could occur as a result of emissions generated from construction equipment, construction activities, and vehicles experiencing congestion because of construction detours or delays. Construction-related air quality effects would result primarily from emissions of heavy-duty construction equipment (e.g., bulldozers, backhoes, and cranes), diesel-fueled mobile sources (e.g., trucks, brooms, and sweepers), diesel- and gasoline-fueled generators, and on-site and off-site project-related vehicles (e.g., service trucks and pickups).

In addition, dust, or fugitive PM, would also be of concern. PM_{10} emissions would be associated with land clearing, ground excavation, grading, cut-and-fill operations, and structure erection. These emissions would vary from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive PM_{10} emissions from construction activities could be noticeable if uncontrolled. Mud and particulates from trucks could also be of concern if construction trucks are routed through streets near sensitive land uses (e.g., residences, schools, and parks).

Construction traffic and lane closures would increase congestion and reduce the speed of other vehicles, which could temporarily increase emissions burdens. These effects would be temporary and generally limited to the immediate area in which the congestion occurred.

In addition to potential air quality impacts, some construction work activities (particularly those involving paving operations using asphalt) could result in short-term odors, which could be detectable to some people near the site and would be diluted as distance from the site increases. The above temporary construction impacts on air quality are similar to what was documented in the 2006 FEIS.

Mitigation

The determination regarding mitigation measures during operations for the proposed Phase 1 Improvements are consistent with the findings for the 2006 FEIS. As detailed above, no meaningful

impact on regional criteria pollutant or MSAT levels is predicted, and because no exceedances of the NAAQS are predicted, no design or operational mitigation measures are required. The 2006 FEIS Air Quality Analysis also did not propose any specific mitigation for operational conditions of the 2006 Build Alternative.

The 2006 FEIS mitigation measures during construction are still valid for the Phase 1 Improvements. Particulate emissions (in the form of fugitive dust during construction activities) are regulated by PSCAA. The operator of a source of fugitive dust is required to take reasonable precautions to prevent fugitive dust from becoming airborne and must maintain and operate the source to minimize emissions (AGCW 1997). Construction impacts from the Phase 1 Improvements will be minimized by incorporating mitigation measures per the WSDOT standard specifications into the construction specifications for the project. A Fugitive Dust Control Plan will be required to be prepared by the contractor prior to construction to comply with PSCAA regulations. This plan will include mitigation measures to control PM_{10}, deposition of particulate matter, and emissions of CO and ozone precursors, as well as MSATs during construction. Specific mitigation measures will include the following, as applicable:

- Spraying exposed soil with water or other dust palliatives.
- Covering all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck).
- Removing particulate matter deposited on paved, public roads.
- Minimizing delays to traffic during peak travel times.
- Placing quarry spall aprons where trucks enter public roads.
- Graveling or paving haul roads.
- Planting of vegetative cover as soon as possible after grading.
- Minimizing unnecessary idling of on-site diesel construction equipment.
- Locating diesel engines, motors, or equipment as far away as possible from existing residential areas.
- Locating staging areas away from school buildings and playgrounds.
- Using efficient street sweeping equipment at site access points and all adjacent streets used by haul trucks.
- Minimizing hours of operation near sensitive receptor areas and rerouting the diesel truck traffic away from sensitive receptor areas.
- Coordinating construction activities with the Puyallup Recreation Center and all other sensitive receptor locations.
- Educating vehicle operators to shut off equipment when not in active use to reduce idling.
- Developing streamlined staging/work zone areas to minimize construction equipment back-ups and idling.
- Using cleaner fuels as appropriate.

The 2006 FEIS proposed similar construction mitigation measures for air quality, and most were project environmental commitments in the 2007 ROD. The above construction mitigation measures and environmental commitments made in the ROD remain applicable to the Phase 1 Improvements.

Conclusion

With adherence to the regulatory requirements described above, no new significant impacts on air quality that were not previously identified in the 2006 FEIS, from either construction or operations, would occur because of the Phase 1 Improvements. The SR 167 Completion Project is included in the latest version of the PSRC's Metropolitan Transportation Plan (MTP) and TIP and meets all of the conformity criteria of 40 CFR Part 93 and WAC Chapter 173-420 and conforms to the SIP. As mentioned above, WSDOT's SR 167 Completion Project has gone through the required interagency coordination process to determine that it is not a project of air quality concern. See also Attachment F Air Quality Technical Memorandum.

4.7 Noise

Affected Environment

The affected environment relative to noise as described in Section 3.6.2 of the 2006 FEIS remains generally applicable to the proposed Phase 1 Improvements. This section summarizes what aspects have changed, both changes to the affected environment documentation requirements, and changes to the physical environmental relative to noise since 2006.

Noise Abatement Criteria

Since the 2006 Tier II FEIS Noise Analysis, WSDOT's Noise Policy and Procedures were updated. The 2011 WSDOT Noise Policy and Procedures have new noise barrier feasibility and reasonableness requirements. For a noise barrier to be feasible it now has to achieve a noise reduction of at least 5 dBA at one receptor, whereas in the 2006 Tier II FEIS analysis it had to achieve a 7 dBA reduction. The 2011 determination of reasonableness evaluates the cost effectiveness of a barrier and includes the number of sensitive receptors benefited by at least 5 dBA reduction, whereas the 2006 Tier II FEIS analysis included receptors benefited by at least 3 dBA. The 2011 determination for noise barrier reasonableness also includes at least a 7 dBA noise reduction for one or more receivers.

The FHWA Noise Abatement Criteria (NAC) (23 CFR 772) are based on speech interference, which is a well-documented effect that is relatively reproducible in human response studies. The traffic noise impacts are quantified using the equivalent sound level (Leq). The Leq is a measure of the average noise level during a specified period of time. A 1-hour period, or hourly Leq [Leq(h)], is used to measure highway noise. Leq is a measure of total noise during a time period that places more emphasis on occasional high noise levels that accompany general background noise levels. For example, if there are two different sounds, and one contains twice as much energy but lasts only half as long as the other, the two would have the same Leq noise levels.

Traffic noise impacts occur when predicted Leq(h) noise levels approach or exceed the NAC established by FHWA, or substantially exceed existing noise levels (FHWA 2010). WSDOT considers a noise impact to occur if predicted Leq(h) noise levels approach within 1 dBA of the NAC. Since the 2006 FEIS, the FHWA NAC has been updated. See Exhibit 4.7-1 for the specified exterior Leq(h) noise levels for various land activity categories. WSDOT also considers an increase of 10 dBA or more to be a substantial increase and a traffic noise impact.

Exhibit 4.7-1. FHWA Noise Abatement Criteria by Land Use

Activity Category	NAC Leq(h) at Evaluation Location (dBA)	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential (single and multi-family units)
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings

Exhibit 4.7-1. FHWA Noise Abatement Criteria by Land Use

Activity Category	NAC Leq(h) at Evaluation Location (dBA)	Description of Activity Category
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. Includes undeveloped land permitted for these activities.
F	—	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	—	Undeveloped lands that are not permitted

Traffic Noise Methodology

The traffic noise analysis methodology described in the Noise Technical Report (February 2004) supporting the 2006 FEIS remains applicable to the SR 167 Project's new proposed Phase 1 Improvements. However, the traffic noise study area, traffic noise measurement, and traffic noise model validation have been updated since 2006, as explained below. Details are provided in Attachment G, Noise Technical Memorandum, and briefly summarized below.

The study area has been updated to reflect the changes made to the SR 167 highway alignment and reduced project scope since the 2006 FEIS. Modeled receivers were located beyond the distance where impacts typically can be modeled to verify that the full impacted area was captured.

Building permits from Pierce County, and the cities of Tacoma, Fife, Edgewood, Milton, and Puyallup were reviewed online in October 2017 to identify potential noise receptors, i.e., residences, commercial uses, or other WSDOT and FHWA noise-regulated land uses NAC Activity Categories B, C, D, E, or F at the properties along the SR 167 Phase 1 noise study area.

Traffic Noise Measurement

The traffic noise measurements have been updated for the SR 167 Project's proposed Phase 1 Improvements. Ambient noise levels were measured in 2015 to identify major noise sources in the project area and to establish existing peak-hour noise levels because most of the project is a new freeway where existing traffic noise levels are consistently low due to the distance to the nearest roadway. The 2015 noise measurements are valid to support this Re-Evaluation.

Fourteen measured sites, and 78 total sites were modeled to represent the outdoor use areas for all noise-sensitive locations within the study area. The location of the 14 noise-measured sites and additional modeled sites are shown in Exhibits 4.7.2 through 4.7-5 Maps (four pages).

Exhibit 4.7-2. Noise Modeling Sites and Noise Impacts Results - Map 1

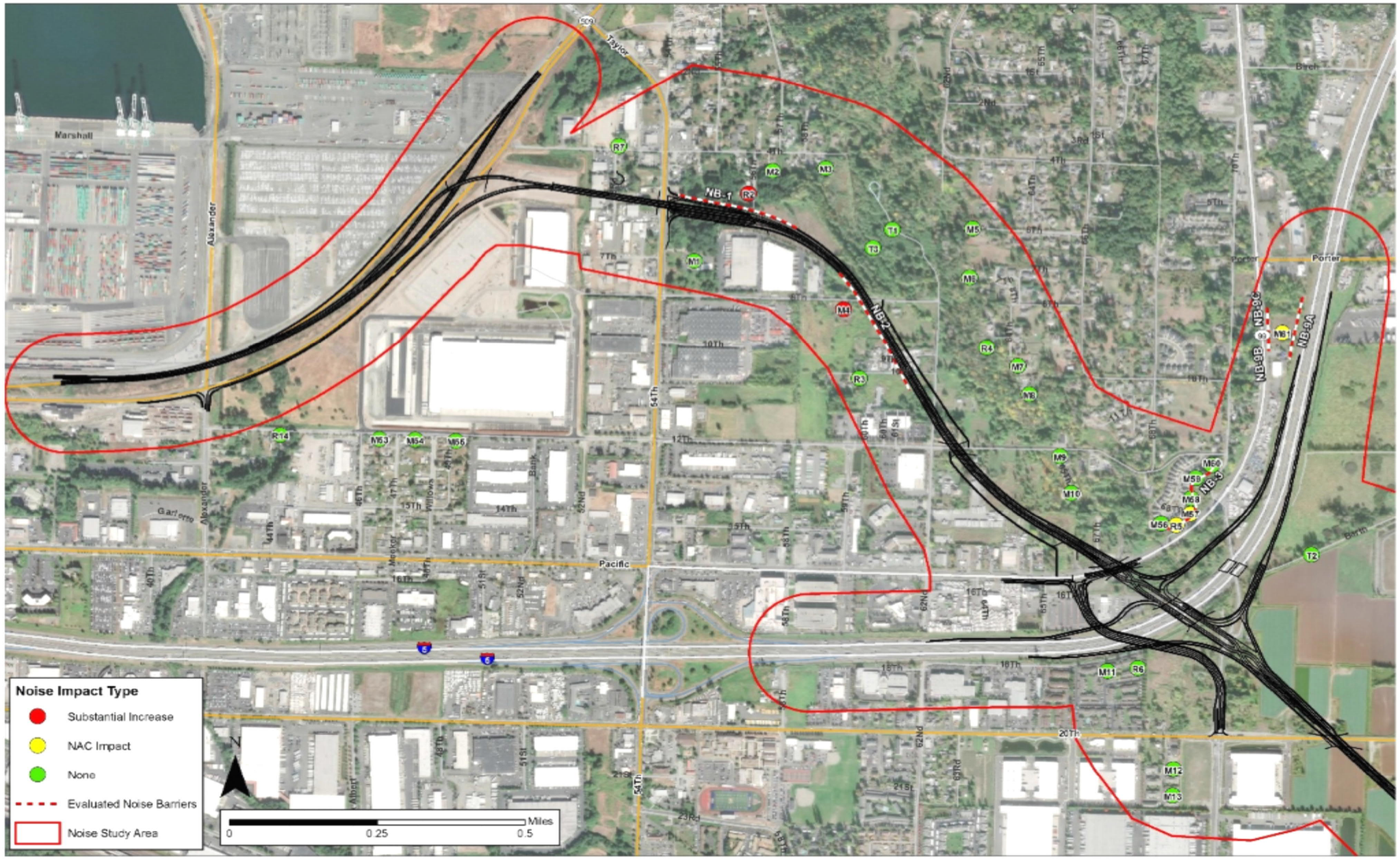


Exhibit 4.7-3. Noise Modeling Sites and Noise Impacts Results – Map 2

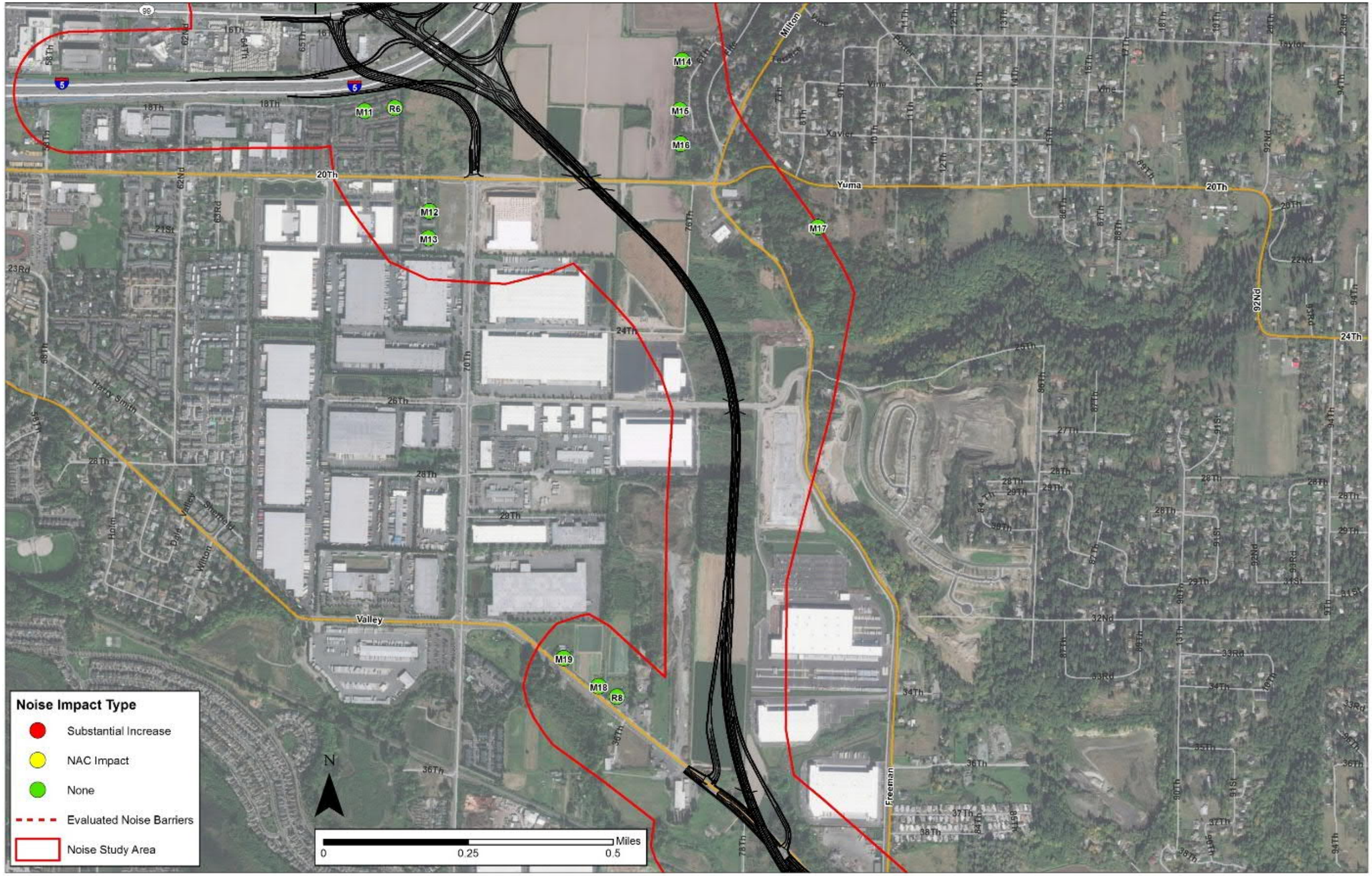


Exhibit 4.7-4. Noise Modeling Sites and Noise Impacts Results – Map 3

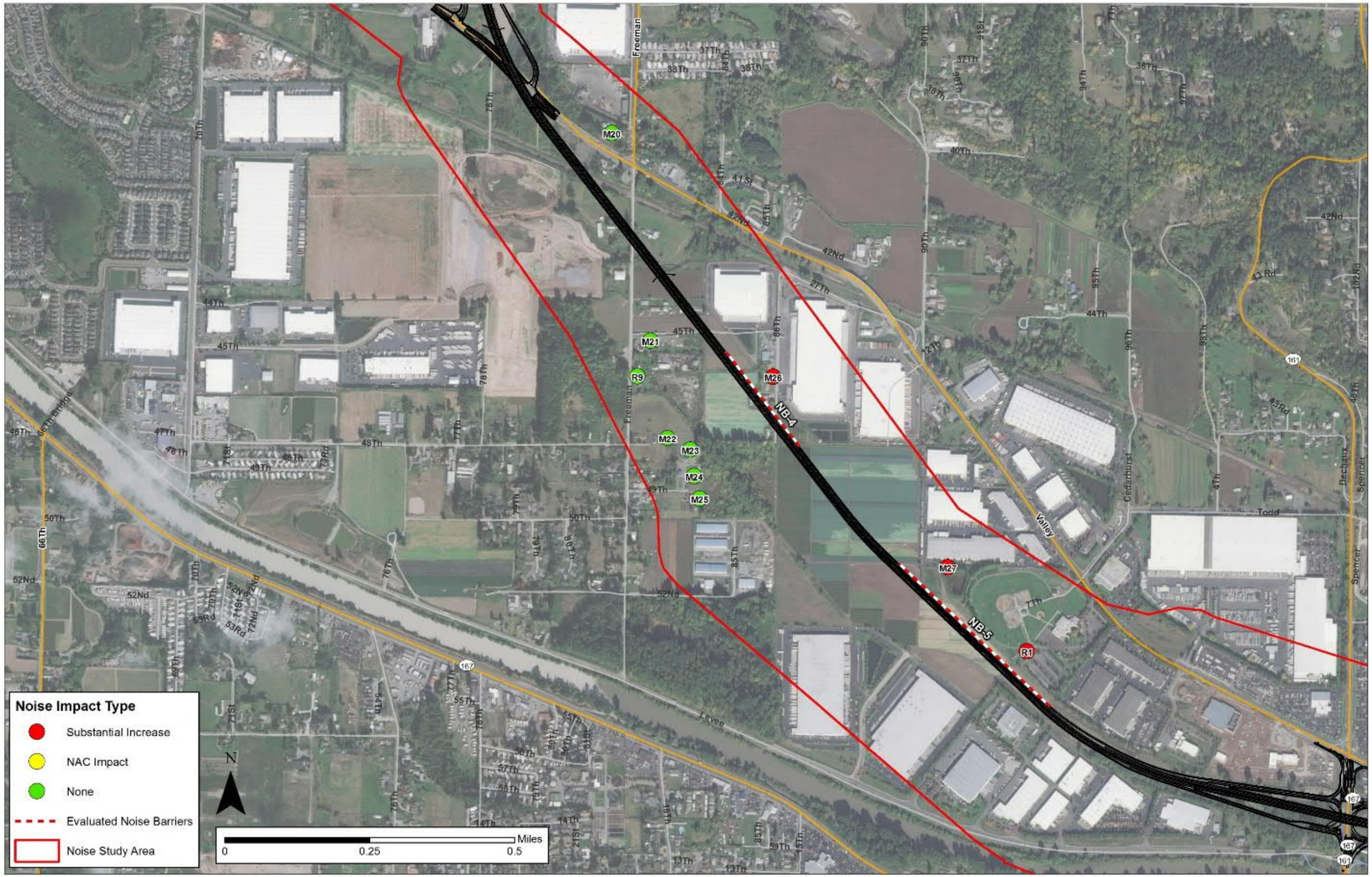
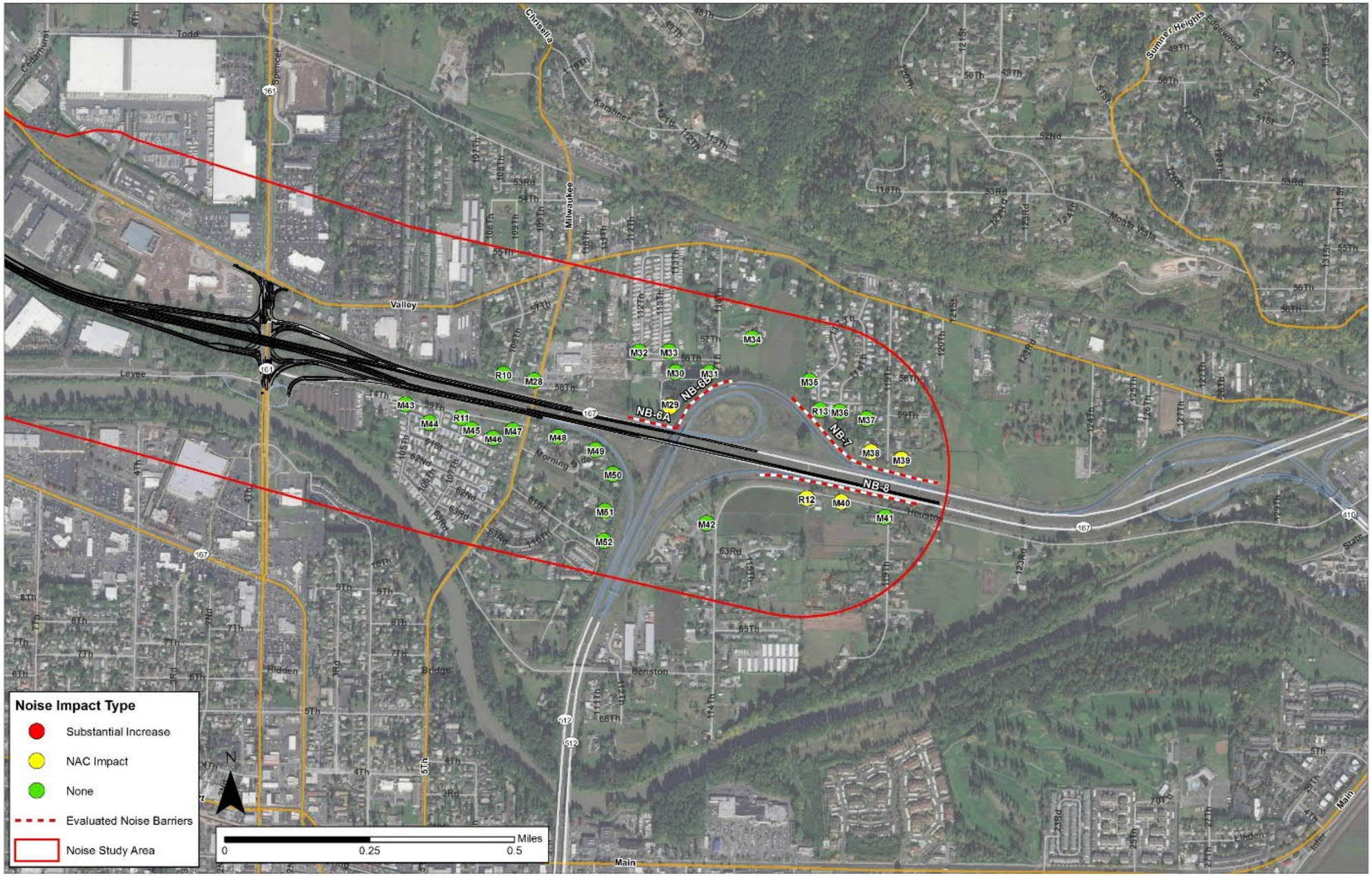


Exhibit 4.7-5. Noise Modeling Sites and Noise Impacts Results – Map 4



Effects during Operation

Design Year (2045) Traffic Noise Levels – Proposed Phase 1 Improvements

Future Build modeled loudest-hour traffic noise levels for residential areas range from 51 dBA to 70 dBA. The modeled noise levels at these receivers depend on the proximity of the receiver to the existing roadways (I-5, SR 99, SR 509, and the existing SR 167 alignment) and the new SR 167 freeway. Of the 78 total receivers, 8 receivers representing 20 residences would experience traffic noise levels above 66 dBA (approach or exceed the NAC) and 5 receivers representing 5 residences and the Puyallup Recreation Center and trail would experience a substantial increase of 10 dBA or greater over existing noise levels.

Roadway traffic noise levels under the proposed Phase 1 would result in a noticeable change in some areas once the project is in operation. Traffic noise levels would increase throughout the project corridor in areas in close proximity to the new SR 167 freeway. Traffic noise levels would be similar to existing traffic noise levels in areas farther from the new SR 167 freeway and any change in noise levels would reflect traffic volume changes along the existing roadway network. Changes in the Build traffic noise levels in 2045 for all modeled receivers would range from a 7 dBA decrease to a 19 dBA increase compared to existing conditions and 2045 traffic noise levels for the No Build Alternative. Future Build traffic noise levels at most modeled receivers would be within 10 dBA of existing noise levels. The highest predicted increases in future Build traffic noise levels (19 dBA over existing noise levels) are a 63 dBA to 65 dBA future traffic noise level predicted at the Puyallup Recreation Center, trail and two nearby residences represented by Sites R1, M26 and M27.

Future Build traffic noise levels are provided in Exhibit 4 of Attachment G, Noise Technical Memorandum.

Traffic Noise Abatement

The traffic noise abatement background described in the Noise Technical Report (February 2004) referenced in the 2006 FEIS remains applicable to the Phase 1 improvements. However, determination of feasibility, determination of reasonableness, and recommendation for traffic noise abatement has changed since 2006.

Noise abatement, including noise barrier evaluation, is necessary only where frequent human use occurs and where a lower noise level would provide benefits (FHWA 2010). To be effective, the barrier must block the line-of-sight between the highest point of a noise source and the receptor. It must be long enough to prevent sounds from passing around the ends, have no openings (i.e., side streets), and be dense enough so that noise would not be transmitted through it. Intervening rows of buildings that are not noise sensitive could also be used as barriers (FHWA 2010).

Abatement was considered for this project because traffic noise impacts are predicted to approach or exceed the NAC or would experience a noise level increase 10 dBA or greater over existing noise levels at 13 modeled sites. The 13 modeled sites are representative of nine discrete areas where noise barrier placement was considered. All nine areas where impacts are predicted were evaluated to determine if a feasible noise barrier could be constructed.

Feasibility

Noise barriers were evaluated at nine (9) locations to determine whether abatement could sufficiently reduce traffic noise levels. Each evaluated noise barrier location includes consideration of multiple barrier heights and lengths in an attempt to achieve WSDOT criteria for feasibility and reasonableness. Noise barriers locations are shown in Exhibit 3 of Attachment G, Noise Technical Memorandum.

Feasibility results are detailed in Exhibit 4.7-6. Eight of the nine noise barriers evaluated were found to be feasible.

Exhibit 4.7-6. Feasibility Analysis

Site (Land Use Category) – and Evaluated Noise Barrier(s)[a]	Existing (Leq) (dBA)	Build (Leq) (dBA)	1st Row?	Min. Design Goal NW		Feasible? Yes/No
				Insertion Loss (dBA)	% 1st Row ≥ 5 dBA	
R2 (B)—Noise Barriers 1	51	62	Yes	5	100 %	Yes
M4 (B)—Noise Barrier 2	51	63	Yes	7	100 %	Yes
M57 (B)—Noise Barrier 3	74	70	Yes	10	100 %	Yes
M26 (B)—Noise Barrier 4	44	63	Yes	5	100 %	Yes
R1 (C)—Noise Barrier 5	46	65	Yes	6	100 %	Yes
M29 (B)—Noise Barrier 6A & 6B	67	68	Yes	8	100 %	Yes
M38 (B)—Noise Barrier 7	68	68	Yes	5	100 %	Yes
M40 (B)—Noise Barrier 8	67	68	Yes	5	100 %	Yes
M61 (B)—Noise Barrier 9A, 9B & 9C	71	67	Yes	2	0%	No

[a] Site shown in one site behind evaluated noise barrier that satisfies feasibility criteria.

Reasonableness

Since potential abatement is feasible at eight locations (Noise Barriers 1, 2, 3, 4, 5, 6A & B, 7, and 8), the reasonableness of abatement was evaluated at each location. Noise walls, or other types of abatement, will only be constructed by WSDOT if they have been determined to be reasonable by satisfying three criteria: Cost Effectiveness, Design Goal Achievement, and Desire for Abatement from Public within the Noise Study Area. The Reasonableness Analysis results are detailed in Exhibit 4.7-7.

Exhibit 4.7-7. Reasonableness Analysis

Site (Land Use Category) – and Evaluated Noise Barrier(s)	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)[a]	Build (L_{eq}) (dBA)[a]	Total Reasonableness Allowance[b]	Total Cost	Reasonable? Yes/No
R2 (B)—Noise Barriers 1	2	51	62	$114,368	$1,143,678	No
M4 (B)—Noise Barrier 2	1	51	63	$60,693	$908,955	No
M57 (B)—Noise Barrier 3	19	74	70	$749,557	$2,336,038	No
M26 (B)—Noise Barrier 4	2	44	63	$170,520	$1,583,911	No
R1 (C)—Noise Barrier 5	4	46	65	$341,040	$1,175,469	No
M29 (B)—Noise Barrier 6A & 6B	5	68	68	$187,654	$960,978	No
M38 (B)—Noise Barrier 7	21	68	68	$779,723	$1,232,653	No
M40 (B)—Noise Barrier 8	5	67	68	$194,672	$928,980	No
M61 (B)—Noise Barrier 9A, 9B & 9C	N/A Barrier was not found to be feasible, therefore no reasonable analysis was completed					

[a] Impacts are noted by bolded values.

[b] Reasonableness cost based on $51.61/ft^2.

Summary

Noise abatement was evaluated for the locations where traffic noise impacts were predicted. No locations met both WSDOT Feasibility and Reasonableness Criteria; therefore, no noise barriers are proposed for the Phase 1 Improvements.

A noise barrier along the south shoulder of existing SR 167 west of Milwaukee Avenue E was found to be feasible and reasonable in the 2006 FEIS. However, the Phase 1 Improvements have a smaller footprint as compared to the 2006 FEIS Build Alternative, and the current (2017) noise analysis showed levels in this area were predicted to be below the NAC; therefore, a noise barrier was not evaluated in this area.

These findings and recommended mitigation are consistent with the 2006 Tier II FEIS Noise Analysis. The new proposed Phase 1 Improvements would not result in a substantial environmental impact regarding operational noise.

Effects during Construction

The temporary construction effects of noise discussed in the 2006 FEIS remain applicable to the proposed Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than the 2006 FEIS Build Alternative.

Construction creates temporary noise. Construction is usually carried out in reasonably discrete steps, each with its own mix of equipment and noise characteristics. For example, construction of this project requires asphalt removal, grading, paving, restriping, deep foundations, bridge construction, retaining walls, drainage systems, utility relocations, and temporary detours just to name a few.

Construction noise is exempt from local noise ordinance regulations during daytime hours. If nighttime construction work between the hours of 10:00 p.m. and 7:00 a.m. is required for this project, WSDOT (or the Design-Builder, dependent on specific contract requirements) would apply for variances or exemptions from local noise ordinances for the night work. Noise variances or exemptions require construction noise abatement measures that vary by jurisdiction. If night work is necessary for this project, noise variances would be acquired from the appropriate city or county agency.

Mitigation

The mitigation measures as described in Section 3.6.6 of the 2006 FEIS remain applicable to the Phase 1 Improvements during construction. Construction noise can be reduced by using enclosures or walls to surround noisy equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment farther away from noise sensitive receivers, e.g., homes. The 2006 FEIS mitigation measures are all still applicable and relevant. The 2006 FEIS identified the following mitigation measures that could be incorporated into construction plans and special provisions to reduce construction noise impacts at nearby receptors (WSDOT 2006):

- Erecting noise berms and barriers as early as possible to provide noise shielding.
- Limiting construction activities to between 7 a.m. and 10 p.m., to reduce construction noise level during nighttime hours in residential areas.
- Equipping construction equipment engines with adequate mufflers, intake silencers, and engine enclosures. This could reduce their noise by 5 to 10 dBA (EPA 1971).
- Turning off construction equipment during prolonged periods of nonuse, to eliminate noise from construction equipment during those periods.
- Requiring contractors to maintain all equipment and train their equipment operators, to minimize noise levels and increase operating efficiency.

- Locating stationary equipment away from receiving properties to decrease noise from this equipment in relation to the increased distance.
- Constructing temporary noise barriers or curtains around stationary equipment that must be located close to residences, to decrease noise levels at nearby sensitive receptors.
- Discussing noise issues at the pre-construction stage and develop community involvement to identify haul roads and sensitive noise receptors.
- Establishing the complaint mechanism during construction of the project.

In addition to the construction noise mitigation measures identified in the 2006 FEIS, the following additional abatement measures can be incorporated into construction plans and contractor specifications to reduce construction noise at nearby receptors:

- Using haul vehicles with rubber bed-liners would reduce noise from loading trucks.
- Equipping trucks with ambient backup alarms would reduce the noise for equipment backing.
- Specifying the quietest equipment available would reduce noise by 5 to 10 dBa.
- Turning off construction equipment during prolonged periods of nonuse would eliminate noise from construction equipment during those periods.

Conclusion

No new significant impacts on noise from construction and operation would occur because of the proposed Phase 1 Improvements that were not previously identified in the 2006 FEIS. See also Attachment G, Noise Technical Memorandum.

4.8 Energy and Greenhouse Gas

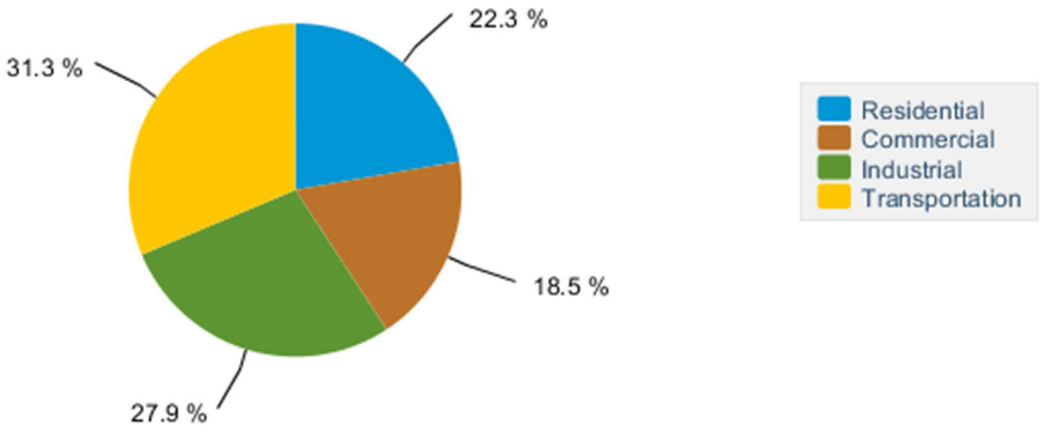
Affected Environment

The affected environment and applicable regulatory requirements relative to energy, as described in Chapter 3.7 of the 2006 FEIS, remains generally applicable to the SR 167 Completion Project's proposed Phase 1 Improvements. Regarding greenhouse gas, analysis was not required and therefore was not completed as part of the 2006 FEIS. WSDOT now requires a greenhouse gas analysis as part of an energy analysis for environmental discipline studies and required NEPA documentation.

Energy

In 2015, transportation was the highest end-use energy consumption sector in Washington state at roughly 31 percent (623 tBtu), followed by the industrial sector at 28 percent (555 tBtu), residential sector at 22 percent (443 tBtu), and commercial sector at 19 percent (368 tBtu) (EIA 2017) (refer to Exhibit 4.8-1.

Exhibit 4.8-1. Washington Energy Consumption by End-Use Sector, 2015



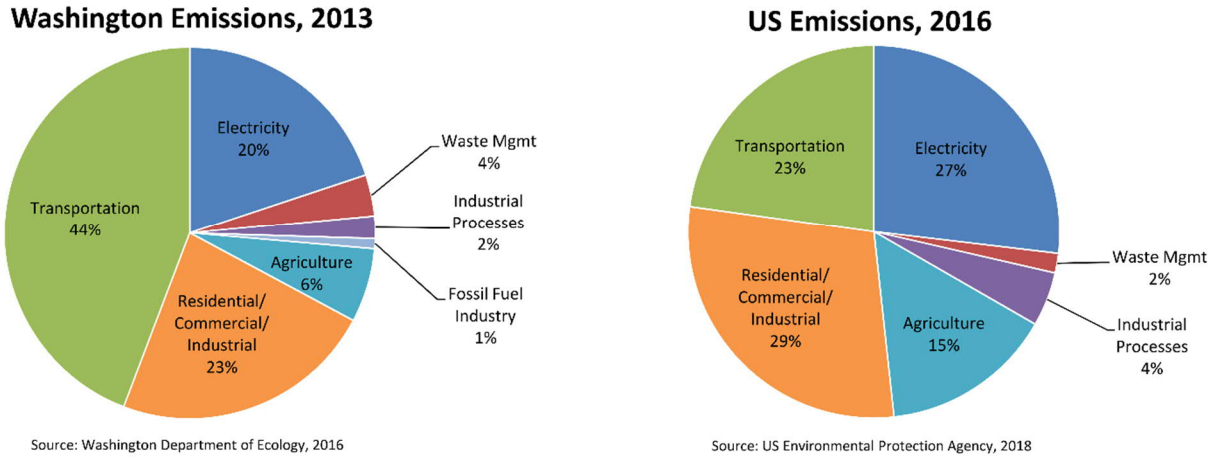
Source: EIA 2017

Within the energy study area, according to the Puget Sound Regional Council (PSRC) travel demand model which provided the base transportation data used in this analysis, most regional miles traveled are in passenger cars and light trucks. Public transit is expected to account for around 10 percent of the regional miles traveled by 2040. Freight traffic is also expected to account for a smaller portion of the regional miles traveled by 2040 as compared to passenger cars and light trucks.

Greenhouse Gas

National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, rail, and boats) accounts for almost 30 percent of total U.S. domestic carbon dioxide (CO2) emissions. In Washington State, transportation accounts for nearly half of the greenhouse gas emissions.

Exhibit 4.8-2. Greenhouse Gas Emissions by Sector in the United States and Washington State



Source: WSDOT 2018

Energy and Greenhouse Gas Methodology

WSDOT's guidance for project-level energy and greenhouse gas analysis was developed through collaboration with internal and external experts (including the U.S. Department of Transportation, EPA, the Washington State Departments of Ecology and Commerce, PSRC, and local clean air agencies, as well as an evaluation of other agency approaches, and an assessment of the tools available for calculating greenhouse gas emissions.

A project-level regional analysis was conducted to estimate the SR 167 Project's proposed Phase 1 Improvements impact on regional energy consumption and greenhouse gas emissions in King and Pierce Counties. The analysis is based on the roadways in the PSRC regional model in King and Pierce Counties, and estimates daily energy and emissions with and without the Puget Sound Gateway Program (encompasses both the SR 167 Completion Project and SR 509 Completion Project).

Energy consumption and greenhouse gas emissions from vehicle operations on the SR 167 Completion Phase 1 Improvements and other nearby roadway facilities that are directly affected by the project were estimated using the latest version of EPA's MOVES2014a model (EPA 2015). In addition to the vehicle operations modeled using MOVES2014a, the fuel cycle carbon dioxide equivalent (CO_2e) emissions and energy consumed have been calculated. The fuel cycle includes emissions released through extraction, refining, and transportation of fuels used by vehicles traveling in the project area. Fuel cycle emissions were calculated by applying the FHWA fuel cycle factor (0.27) to the MOVES2014a modeled results.

Operational analysis was conducted for existing conditions (2015) and the project's design year (2045). Construction energy use was qualitatively assessed in the 2006 FEIS, whereas a quantitative analysis is now required under the current WSDOT guidance. Construction and maintenance energy consumption and greenhouse gas emissions were calculated using FHWA's Infrastructure Carbon Estimator (ICE) spreadsheet tool, which incorporates project features and construction traffic delays to calculate CO_2e emissions and energy consumption from construction equipment, materials, and routine maintenance.

Effects during Operation

Energy

Energy consumption under both the proposed SR 167 Phase 1 Improvements (Build Alternative) and No Build (2045) condition is expected to be less than Existing Conditions (2015), despite an increase in miles

traveled in the study area (Exhibit 4.8-3). This decrease in energy consumption is expected as federal fuel economy standards are phased in.

The estimated energy consumption for the 2045 Build scenario is slightly higher than that for the No Build condition; the increase is attributed to the 0.5 percent increase in VMT. As noted above, the Build scenario energy consumption is well below Existing Conditions.

The proposed Phase 1 Improvements would not result in a new substantial environmental impact regarding energy consumption, which is consistent with the 2006 FEIS qualitative energy analysis.

Exhibit 4.8-3. 2045 Yearly Roadway Vehicle Energy Consumption

Area	2015 Existing	2045 No Build	2045 Phase 1 Improvements
Vehicle Miles Traveled	18,470,785,650	22,334,511,000	22,453,605,000
Percent Vehicle Miles Traveled increase compared to Existing Conditions (%)	N/A	20.9	21.6
Percent Vehicle Miles Traveled increase compared to No Build (%)	N/A	N/A	0.5
Tailpipe Energy Consumption (mBtu)	110,269,149	81,104,688	84,787,837
Fuel Cycle Energy Consumption (mBtu)	29,772,670	21,898,266	22,892,716
Energy Consumption (mBtu) increase compared to Existing Conditions (%)	N/A	-26.4	-23.1
Energy Consumption (mBtu) increase compared to No Build (%)	N/A	N/A	4.5

mBtu = million British thermal units; N/A = Not applicable because compared to No Build/Existing Conditions

Greenhouse Gas

The 2006 FEIS did not address greenhouse gases, as WSDOT did not have greenhouse gas guidelines or requirements at that time.

Estimated greenhouse gas emissions for the SR 167 Phase 1 Improvements (Build Alternative) and No Build (2045) condition are predicted to be less than Existing Conditions (2015), despite an increase in regional vehicle miles traveled (Exhibit 4.8-4 below). This decrease in emissions is expected as federal fuel economy standards are phased in.

SR 167 Phase 1 Improvements (2045) greenhouse gas emissions are predicted to increase by 4.6 percent as compared to a No Build scenario (2045), which is attributed to the 0.5 percent increase in VMT. As noted above, the Build scenario greenhouse gas emissions are estimated to be well below Existing Conditions.

The SR 167 Phase 1 Improvements would not result in a new substantial environmental impact regarding greenhouse gas emissions.

Exhibit 4.8-4. 2045 Yearly Roadway Vehicle Greenhouse Gas Emissions

Area	2015 Existing	2045 No Build	2045 Phase 1 Improvements
Vehicle Miles Traveled	18,470,785,650	22,334,511,000	22,453,605,000
Percentage Vehicle Miles Traveled increase compared to Existing (%)	N/A	20.9	21.6
Percentage Vehicle Miles Traveled increase compared to No Build	N/A	N/A	0.5%
Tailpipe Greenhouse Gas Emissions (Metric Tons)	9,283,537	6,825,553	7,136,759
Fuel Cycle Greenhouse Gas Emissions (Metric Tons)	2,506,555	1,842,899	1,926,925
Percent increase Greenhouse Gas Emissions compared to Existing	N/A	-26.5%	-23.1%
Percent increase Greenhouse Gas Emissions compared to No Build	N/A	N/A	4.6%

Effects during Construction

The proposed Phase 1 Improvements would not result in any new temporary construction effects, which is consistent with the findings of the 2006 FEIS Energy Analysis.

Effects during construction and maintenance energy consumption and greenhouse gas emissions were calculated using FHWA's Infrastructure Carbon Estimator (ICE) spreadsheet tool, which incorporates project features and construction traffic delays to calculate CO2e emissions and energy consumption from construction equipment, materials, and routine maintenance.

The Phase 1 Improvements analysis includes the effects of constructing the project. Exhibit 4.8-5 below reports FHWA's ICE tool construction of project features CO2e emissions and energy consumption results annualized per year over a 20-year period. Construction energy impacts are temporary or short-term in nature. Energy used during construction of the Phase 1 Improvements and in the manufacture of construction materials would be irretrievable. However, construction would not adversely affect the continued availability of energy, because the scale of the proposed project is negligible when compared to energy production in Washington state, the United States, or globally.

Exhibit 4.8-5. Annualized Construction and Maintenance Energy Consumption and CO2e Emissions, per Year over 20 Years

Scenario	Estimated CO2e Emitted (metric tons per year over 20 years)	Total Estimated Energy Consumed (mmBtu per year over 20 years)
No Build[a]	59	819
Proposed Phase 1 Improvements[b]	981	14,171

[a] Only includes routine maintenance activities.

[b] Includes both construction and routine maintenance activities.

The above construction impacts on energy consumption are similar to what was documented in the 2006 FEIS, and construction of the proposed SR 167 Phase 1 Improvements and design features would not result in a measurable impact on regional or local fuel availability.

Mitigation

The SR 167 Completion Project's new proposed Phase 1 Improvements would not result in any new significant environmental impacts regarding operational energy and greenhouse gas emissions, and no mitigation is proposed. As detailed above, no substantial impacts on energy use and greenhouse gas emissions are predicted, therefore no mitigation measures are proposed for operational conditions. The 2006 FEIS Energy Analysis also concluded that no mitigation was necessary for operational conditions for the 2006 Build Alternative.

Similarly, the 2006 FEIS identified no mitigation measures for energy or greenhouse gas emissions during construction. Since then, WSDOT has established standard practices to reduce energy use and greenhouse gas emissions from construction. These practices include:

- The project traffic control plan will include detours and strategic construction timing (such as night work) to continue moving traffic through the area and reduce backups and delays to the traveling public to the extent possible.
- Encourage carpooling or vanpools among construction workers to minimize the number of vehicles used by workers to and from work and to reduce congestion at the start and end of construction shifts.
- WSDOT contractors will set up active construction areas, staging areas, and material transfer sites in a way that reduces standing wait times for equipment during construction.

Conclusion

The proposed Phase 1 Improvements would have no new significant impacts relative to energy or greenhouse gas from either construction or operations, confirming the finding of the 2006 FEIS. See also Attachment H, Energy and Greenhouse Gas Technical Memorandum.

4.9 Hazardous Materials

Affected Environment

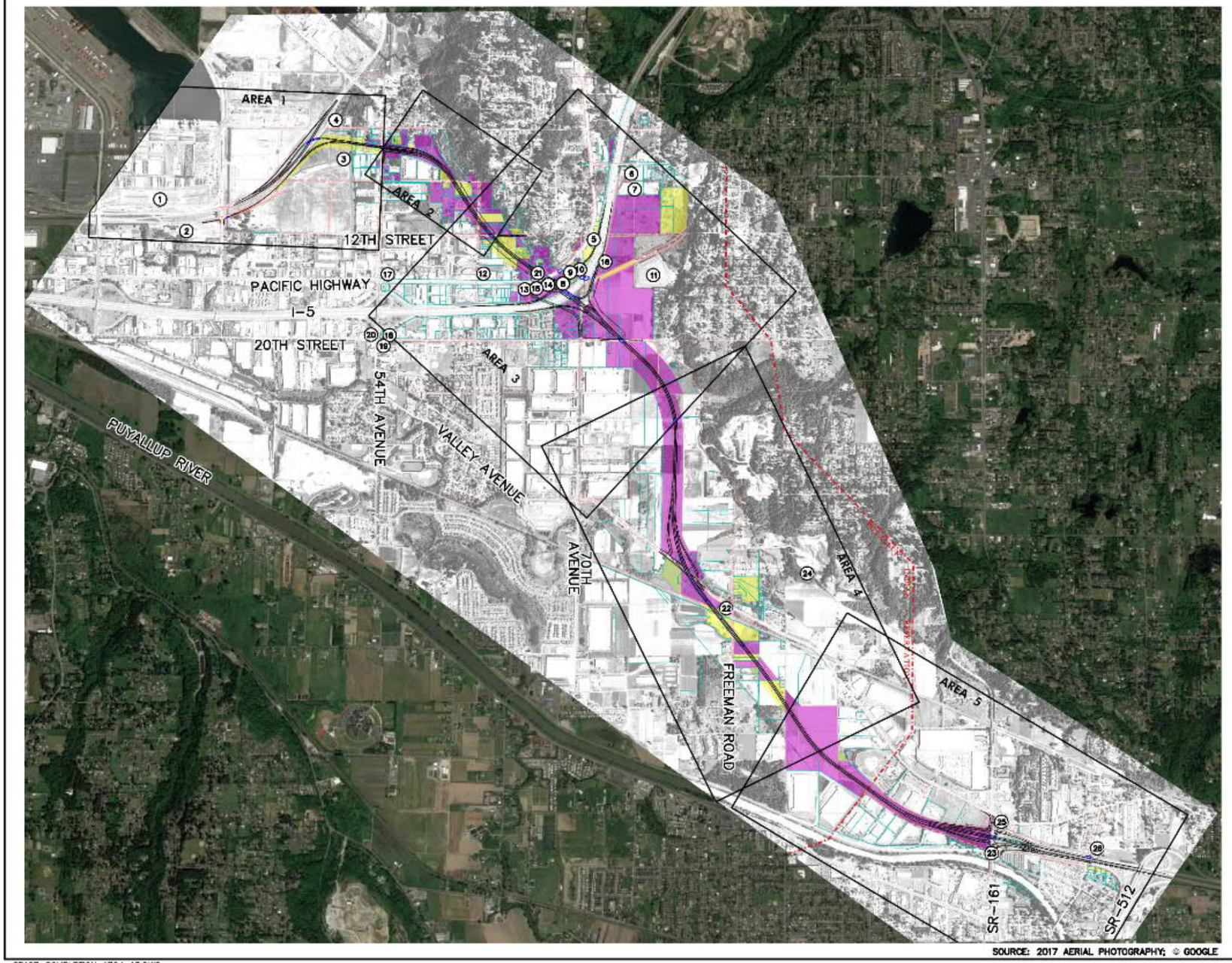
An updated Hazardous Materials analysis was conducted in 2017 to re-evaluate the known hazardous materials sites along the SR 167 Completion Project corridor and assess the potential risks of the hazardous material sites associated with, or potentially impacted by, the Phase 1 Improvements.

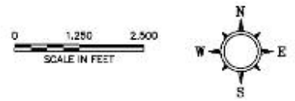
For the 2006 FEIS, 189 sites were included in the initial site screening analysis. The updated (2017) analysis identified 221 sites of potential concern within one mile of the proposed Phase 1 Improvements footprint. The sites of potential concern included state cleanup sites, Voluntary Cleanup Program sites (VCP), independent cleanup sites, sites with Underground Storage Tanks (USTs), hazardous waste generators, sites with reported hazardous material spills, sites with solid waste landfills, and Leaking Underground Storage Tank (LUST) sites. The sites are prioritized (ranked) according to the extent of contamination and distance from the SR 167 Phase 1 Improvements Project corridor. Most the sites were eliminated from further consideration based on screening criteria established for the updated hazardous materials analysis.

In summary, 26 identified hazardous materials sites were evaluated in the updated analysis, as compared to 31 sites evaluated in the 2006 FEIS. The sites presented on Exhibit 4.9-1 and summarized in Exhibit 4.9-2, as potentially impacted by or that pose risk to the 167 Phase 1 Improvements. The sites are further classified (ranked) as High, Moderate, or Low Risk in accordance with WSDOT's Hazardous Materials Discipline Report Guidance:

- "High Risk" sites are sites of concern that may be substantially contaminated and will create a major liability for WSDOT either in construction liability or by virtue of acquiring all or a portion of the site. If the site has undergone a detailed investigation and feasibility study, the impacts and remediation costs may already be predicted. Nonetheless, the site is identified as a high impact site because of its potentially substantial impact or liability. In general, high risk sites are properties that may have large volumes of contaminated soil, groundwater, or sediment or properties that have multiple complex types of contaminants that require special handling and disposal that is expensive to manage. High risk sites include properties where the information necessary to predict remedial costs is lacking and/or the contaminants are persistent or expensive to manage.
- "Moderate Risk" sites are sites of concern where the likelihood for the site to impact the project is moderate because of the type or extent of contamination, groundwater from the site of concern is impacted and has a reasonable potential to impact the project footprint from offsite migration of groundwater, but there is no conclusive evidence.
- "Low Risk" sites are sites of concern where the likelihood for the site to impact the project is low because there is no evidence to suggest that groundwater from the site of concern is impacted, or the contamination from off-site migration is not expected to impact the project during construction.

Exhibit 4.9-1. Hazardous Materials Locations





LEGEND

ACQUIRED PARCEL
PARCEL TO BE ACQUIRED

SOURCE

1. AUTO WAREHOUSING CO.
2. COAST ENGINE & EQUIPMENT CORP
3. DELICOR OF PUGET SOUND INC.
4. WOOD CHIP STORAGE YARD
5. USG INTERIORS INC. 99 SITE
6. NORTH AMERICAN CRANE & EQUIPMENT CO LLC
7. H & H DIESEL
8. WSDOT PROPERTY– 6722 PACIFIC HWY E.
9. PRYZBYLSKI PROPERTY– 6912 PACIFIC HWY E.
10. WSDOT PROPERTY– 6924 PACIFIC HWY E.
11. B & L WOODWASTE LANDFILL
12. CENTURY LINK QC
13. LIBERTY DISTRIBUTING CO/VITAMILK DAIRY FIFE
14. RICK SEXTON DRUMS
15. RICHARD JOHNSON PROPERTY
16. OLYMPIC PIPELINE
17. CIRCLE K STORE 5486 BP OIL (FORMERLY BP TOSCO 11073)
18. SHELL STATION 121396 (FORMERLY TEXACO)
19. FORMER UNOCAL SERVICE STATION 4836
20. CHEVRON (FORMERLY CAC INC. 97135)
21. WSDOT PROPERTY– 6713 PACIFIC HWY E.
22. FIRWOOD GROCERY
23. SR167 / 20E STEEL BRIDGE
24. BOENING RESIDENTIAL PROPERTY
25. TESORO STATION #62052 (FORMERLY ARCO #5898)
26. PSE PUYALLUP, SVC

Hazardous Materials Locations

Exhibit 4.9-2. Hazardous Materials Locations

Number	Facility Site ID (FSID)[a]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
Areas 1 and 2						
1	97814788	Auto Warehousing Co.	3715 SR 509 N. Frontage Road, Tacoma, WA	Leaking underground storage tank (LUST) with remediated petroleum and non-halogenated solvent contamination in groundwater and soil. Cleanup has started.	One-half mile downgradient/cross gradient from the project footprint.	Low Risk. The project is located one-half mile downgradient / cross gradient to the project. Cleanup activities began in 2008.
2	26693246	Coast Engine & Equipment Corp	4012 SR 509, Tacoma, WA	Ecology No Further Action (NFA) reported in November 2016. Remediated metal, petroleum product, and non-halogenated solvent contamination in groundwater. Remediated arsenic, metals, petroleum product, and phenolic compound contamination in soil.	Located adjacent and potentially upgradient to the project footprint.	Low Risk. Site received an NFA in 2016.
3	3514[c] (71984716)	Former Delicor of Puget Sound Inc. site.	5200 4th St E, Tacoma, WA	Underground contamination may be present from a former single walled underground storage tank (UST) that was removed in 1996.	Located adjacent to the project footprint and the Fife Ditch crossing.	Moderate Risk. UST has been removed but condition of the site remains uncertain. Moderate likelihood of encountering contaminated groundwater.
4	6766480	Wood Chip Storage Yard	SR 509 N & 4th ST E, Tacoma, WA	Confirmed arsenic contamination in soil, suspected arsenic contamination in groundwater and surface water. Suspected additional metals contamination to soil. Site is awaiting cleanup.	Located approximately 200 feet north of project footprint. Not acquiring source.	Low Risk. This site lies approximately 200 feet north (and across 4th Street E) of property that will be acquired for the project. Low likelihood that arsenic contamination in groundwater has migrated away from the site onto WSDOT property.
Area 3						
5	84531356	USG Interiors Inc. 99 Site	7110 Pacific Hwy E, Tacoma, WA	Heavy arsenic contamination in soil, groundwater, and surface water. Cleanup has started.	Within the project footprint. Project will acquire this property.	High Risk due to the site location within the project footprint. Hotspots of arsenic contamination remain in soil and groundwater. In-situ remediation in place. Construction of the I-5 southbound off ramp could interfere with remediation. Project will acquire contaminant source area. Strong likelihood of encountering arsenic contamination during relocation of Hylebos Creek.
6	42781887	North American Crane & Equipment Co LLC	405 Porter Way, Milton, WA	Asarco smelter slag potentially used as fill in the area. Remediated petroleum product contamination in soil.	May be within project footprint, but undetermined at this time. Project may be acquiring this property for riparian restoration.	High Risk due to the potential presence of Asarco smelter slag in the fill. Petroleum contamination resulting from a tractor trailer accident has been remediated and the Site received an NFA in 2011. Characterization of soil and groundwater will reduce the risk of discovering contamination during construction.
7	89863773	H & H Diesel	407 Porter Way, Milton, WA	Confirmed arsenic, lead, non-halogenated solvents, petroleum products, and benzene contamination and suspected metals contamination in soil. Suspected arsenic contamination in surface water. Metals and petroleum products contamination in groundwater. Site has been removed from the VCP for lack of cleanup action and response (2013).	May be within the project footprint, but undetermined at this time. Project may be acquiring this property.	High Risk due to the site location potentially within the project footprint, known contamination on property, and potential presence of Asarco smelter slag in the fill. The project will encounter contamination during excavation of site fill and riparian restoration activities.
8	23264	WA DOT Property	6722 Pacific Hwy E, Fife, WA	Arsenic contamination in groundwater and benzene contamination in soil. Site is awaiting cleanup.	Within the project footprint. Site already purchased by the project.	High Risk due to the site location within the project footprint. Site is awaiting cleanup. Strong likelihood project will encounter contamination if drilled shafts are constructed on the property.
9[b]	N/A	Pryzbylski Property	6912 Pacific Hwy E, Fife, WA	Mineral oil spill reported on the property in 2006. Suspected pesticides, petroleum product, polycyclic aromatic	Within the project footprint. Site may	High Risk due to the site location within the project footprint. Strong likelihood project will encounter contamination. Characterization of soil and

Exhibit 4.9-2. Hazardous Materials Locations

Number	Facility Site ID (FSID)[a]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
				hydrocarbon (PAH), and phenolic compound contamination in groundwater.	be acquired by the project.	groundwater will reduce the risk of discovering contamination during construction.
Area 3 (cont.)						
10[b]	2314625	WA DOT Property	6924 Pacific Hwy E, Fife, WA	Heating oil spill reported on the property in 2006. Pesticides, petroleum product, PAH, and phenolic compound contamination confirmed in groundwater and suspected in soil. Site is awaiting cleanup.	Within the project footprint. Site already purchased by the project.	High Risk due to the site location within the project footprint. Site is awaiting cleanup. Strong likelihood project will encounter contamination. Characterization of soil and groundwater will reduce the risk and cost of discovering contamination during construction.
11	1203	B&L Wood Waste	Milton Way, Milton, WA	Arsenic contaminated soil and groundwater. Cleanup actions largely constructed. Contaminant source remains, site is in monitoring phase.	Adjacent to the project footprint.	Moderate Risk due to the site location adjacent to the project footprint. This site has been well characterized, cleanup action construction is largely complete, and site is in monitoring phase. Low likelihood project will encounter contamination in groundwater or soil during riparian restoration.
12	37432679	Commercial Sales Inc. / Century Link QC	1427 62nd Ave E, Fife, WA	Suspected diesel contamination in groundwater. Remediated diesel contamination in soil. UST potentially on site.	Located approximately 700 feet west and cross gradient of the project footprint. Project will not acquire this property.	Low Risk. Past site reconnaissance recorded tanks, parts, and equipment on the site.
13	5969[c] (43644518)	Liberty Distributing Co / Vitamilk Dairy fife	6527 Pacific Hwy E, Fife, WA	Possible ACM and lead contamination remains. Former USTs onsite have been removed. No additional information (2017).	Within the project footprint. Project has already acquired this property.	Low Risk. A hazardous building materials assessment will reduce the risk of discovering hazardous materials during construction.
14[b]	N/A	Rick Sexton drums	6716 Pacific Hwy E, Fife, WA	Possible ACM and lead contamination. No additional information (2017).	Within the project footprint. Already acquired by the project.	Low Risk. A hazardous building materials assessment will reduce the risk of discovering hazardous materials during construction.
15	9072[c] (28927352)	Richard Johnson Property	6708 Pacific Hwy, Fife, WA	Two USTs remain on the site. No additional information (2017).	Within the project footprint.	Low Risk if USTS are removed before construction.
16	N/A	Olympic Pipeline	Follows I-5 closely from Puyallup River to SR 18	No known contamination. Jet fuel, diesel, and gasoline product running through the pipe 24 hours per day.	Within the project footprint.	Moderate Risk assuming the risks associated with damaging the pipeline are fully accounted for during planning, design, and/or pipeline re-location prior to construction.
17	62556434	Circle K Store 5486 BP Oil (formerly BP Tosco 11073)	5405 Pacific Hwy E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Located 1,000 feet down gradient from project footprint.	Low Risk due to proximity of the site to the project area. Cleanup has begun at this site. Petroleum products are relatively straight forward to manage if encountered.
18	96352712	Shell Station 121396 (formerly Texaco)	5501 20th St E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Close proximity to the project footprint. Located 400 feet up gradient.	Low Risk due to being upgradient of the project area. Cleanup has begun at this site. Low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur.
19	4687	Unocal Service Station 4836 Former	2001 54th Ave E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Close proximity to the project footprint. Located 400 feet up gradient.	Low Risk due to being upgradient of the project area. Ecology routine cleanup ended in 2008. Petroleum products are relatively straight forward to manage if encountered. Low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur.
20	47389264	Chevron (formerly CAC Inc. 97135)	5319 20th St. E, Fife, WA	Metals and non-halogenated solvent (including Methyl tert-butyl ether [MTBE]), petroleum and PAH contamination in	Close proximity to the project footprint.	Low Risk due to being upgradient / cross gradient of the project area and low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur. Cleanup has begun at this site. The

Exhibit 4.9-2. Hazardous Materials Locations

Number	Facility Site ID (FSID)[a]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
				groundwater, and petroleum and PAH contamination in soil. Cleanup has started.		size of the contaminated plume has not been delineated. MTBE and benzene are very mobile in groundwater but have a low potential to impact the project.
Area 3 (cont.)						
21[b]	N/A	WA DOT Property	6713 Pacific Hwy E, Fife, WA	Suspected petroleum contamination in soil and confirmed petroleum contamination in groundwater from a leaking UST discovered in 2017.	Within project footprint.	High Risk due to the site location within the project footprint. Strong likelihood project will encounter contamination. Characterization of soil and groundwater will reduce the risk and cost of discovering contamination during construction.
Area 4						
22	95563821	Firwood Grocery	8124 Valley Ave E, Fife, WA	Confirmed petroleum contamination in soil and suspected petroleum contamination in groundwater. Suspected UST.	Located upgradient of project footprint. A decision on acquisition of this property is pending.	Moderate risk due to the confirmed presence petroleum contamination in the soil and groundwater.
Area 5						
23	N/A	SR167 / 20E Steel Bridge	North Meridian, Puyallup, WA	Lead based paint on structure.	Currently located within project footprint. Steel truss is scheduled for removal or demolition by mid-2019, prior to start of Project's Stage 2 construction.	Low Risk if lead based paint is managed appropriately during removal or demolition of the steel truss, prior to construction.
24	23957	Boening Residential Property	3824 90th Ave E, Edgewood, WA	Suspected metals, non-halogenated solvents, and diesel contamination in soil. Suspected diesel contamination in groundwater. Site is awaiting cleanup.	Located adjacent to proposed Riparian Restoration Area.	Low Risk. Contamination is only suspected.
25	22931178	Tesoro Station #62052 (Formerly Arco #5898)	102 Valley Ave NE, Puyallup, WA	LUST site with petroleum product and MTBE contamination to groundwater. Site received an NFA in 2002.	Located adjacent/upgradient of the project footprint.	Moderate Risk. Site received an NFA for cleanup activities conducted, however MTBE is very mobile and may have migrated into the project footprint.
26	1313	PSE Puyallup, SVC	5807 Milwaukee Ave E. Puyallup, WA	Confirmed halogenated organics, metals, non-halogenated solvents, petroleum hydrocarbon, and PCB contamination in groundwater. Cleanup has started.	Located Approximately 750 feet cross gradient of the project footprint.	Low Risk due to being located cross gradient of the project footprint.

a For more information on each of these Washington State Department of Ecology cleanup sites, enter the FSID into: https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx.

[b] Drilled shaft construction anticipated on property.

[c] Washington State Department of Ecology UST ID. Historical FSID in parenthesis.

Shaded cells indicate sites newly identified during the current (2017) Analysis (i.e., did not appear in the 2006 FEIS)

Effects during Operation

The newly identified impacts related to hazardous materials from the Phase 1 Improvements are summarized below. The identified sites are segregated into five geographic areas for ease of illustration and discussion purposes, as depicted on Exhibit 4.9-1, and detailed in Exhibit 4.9-2.

Areas 1 and 2

The identified hazardous materials sites in Areas 1 and 2 do not vary substantially from the sites identified in the 2006 FEIS. Two new hazardous materials sites not listed in the 2006 FEIS were identified in Areas 1 and 2 during the current Analysis.

WSDOT does not plan to acquire the former Delicor of Puget Sound Inc. property (Exhibit 4.9-1, Number 3), but it is adjacent to the project footprint. The site had a registered UST which was removed in 1996. The former Delicor property is identified as "Moderate Risk," due to the potential for encountering contaminated groundwater during construction.

The Woodchip Storage Yard (Exhibit 4.9-1, Number 4), located 200 feet north of the project footprint with documented arsenic contamination in soil, was identified as "Low Risk" during the current Analysis. There is a low likelihood that contaminated groundwater from this site would migrate into the project footprint.

Area 3

The identified hazardous materials sites in Area 3 do not vary substantially from the sites documented in the 2006 FEIS. Three hazardous materials sites previously identified in Area 3 in the 2006 FEIS were identified as "High Risk" during the current Analysis.

The "High Risk" sites previously identified in Area 3 included USG Interiors Inc. 99 (Exhibit 4.9-1 Number 5) and H & H Diesel (Exhibit 4.9-1, Number 7). If WSDOT ultimately determines to purchase these properties for the alignment or riparian restoration areas, WSDOT would acquire sources of arsenic contamination and would potentially assume ongoing cleanup liability/risk.

The Olympic Pipeline (Exhibit 4.9-1, Number 16) was also identified as "Moderate Risk" because of the various product fuels that continuously flow through it. However, the pipeline area is not known to be contaminated, or to have had spills/ releases of fuels to the environment. At this time WSDOT anticipates having to re-locate a portion of the pipeline. This would be handled as a utility issue, with all due planning and care to avoid impacting the pipeline during WSDOT's construction of the Phase 1 Improvements.

Finally, North American Crane and Equipment Company LLC (Exhibit 4.9-1, Number 6) was identified as "High Risk" due to the potential presence of Asarco smelter slag in the fill.

Four new sites were identified during this current Analysis in Area 3 that were not documented in the 2006 FEIS. Two of the newly identified sites are WSDOT-owned parcels located near the I-5 interchange and were assessed to be "High Risk" (Exhibit 4.9-1, Numbers 8 and 10). These parcels both have confirmed soil and groundwater contamination and are awaiting cleanup. Additionally, drilled shaft construction could potentially occur on Number 10. Another newly identified WSDOT-owned property, was assessed to be "High Risk" due to a leaking UST discovered and removed in 2017. This parcel (Exhibit 4.9-1, Number 21) has suspected petroleum contaminated soil and confirmed petroleum contaminated groundwater. Drilled shaft construction could potentially occur on this property. Finally, one newly identified property, the Pryzbylski Property, which WSDOT may acquire, was assessed to be "High Risk." This parcel (Exhibit 4.9-1, Number 9) is adjacent to Number 10 and is suspected of having similar groundwater contamination. Drilled shaft construction could potentially occur on this property.

Area 4

Of the hazardous materials sites in Area 4 identified in the 2006 FEIS, only the Firwood Grocery (Exhibit 4.9-1, Number 22) remains as a hazardous materials site. No new hazardous materials sites were identified in Area 4 during this Analysis.

Area 5

The identified hazardous materials sites in Area 5 do not vary substantially from the sites identified in the 2006 FEIS. Two new hazardous materials sites were identified in Area 5 during this Analysis.

The Boening residential property (Exhibit 4.9-1 Number 24), is located adjacent to a proposed RRP Area, and was assessed to be "Low Risk." This property has suspected metals, nonhalogenated solvents, and diesel contamination in soil, and suspected diesel contamination in groundwater. However, this parcel would not be acquired by WSDOT, and is not anticipated to be impacted.

PSE Puyallup, SVC (Exhibit 4.9-1 Number 26) was identified due to confirmed halogenated organics, metals, nonhalogenated solvents, petroleum hydrocarbon, and PCB contamination in the groundwater. However, this property was assessed to be "Low Risk" due to its location approximately 750 feet cross-gradient from the project footprint.

Additional Properties

There are still multiple properties planned for acquisition by WSDOT. There is the potential that undocumented spills or releases have contaminated environmental media at these properties.

Effects during Construction

The major construction activity associated with Phase 1 Improvements where contaminated soil and groundwater could be encountered is in areas where drilled shafts are necessary along the project corridor. It is anticipated that several sites would potentially have ground or sub-surface disturbance activity during construction that may result in encountering hazardous materials. These properties are identified in Exhibit 4.9-2. Exhibit 4.9-2 also provides detailed site information and individual assessments of the risks for each of the sites of concern.

The temporary construction effects discussed in the Build Alternative of Section 3.8.3 of the 2006 FEIS remain generally applicable to the Phase 1 Improvements. The following sites were newly identified as hazardous materials sites with risks (High, Medium, or Low) posed to the SR 167 Phase 1 Improvements:

- Number 3 - Former Delicor of Puget Sound, Inc.
- Number 4 - Wood Chip Storage Yard
- Number 8 - WSDOT Property
- Number 9 - Pryzbylski Property
- Number 10 - WSDOT Property
- Number 21 - WSDOT Property
- Number 24 - Boening Residential Property
- Number 26 - PSE Puyallup, SVC

Mitigation

The characterization and remediation of contamination has progressed at many of the sites identified by this updated analysis. Similar to the 2006 FEIS Build Alternative, no mitigation measures are proposed or necessary during the operation phase of the Phase 1 Improvements.

Mitigation measures during construction of the proposed Phase 1 Improvements would be consistent with those described for the 2006 FEIS. Clean up is the proposed mitigation for any hazardous waste site that might be found in the SR 167 ROW.

There are multiple buildings that will be demolished during the construction of the preferred alternative and/or widening of existing I-5 ROW. It is possible that some of the structures to be acquired by WSDOT may contain Asbestos Containing Materials (ACM) and Lead Based Paint (LBP). Prior to acquisition, WSDOT will conduct an initial site assessment for each property for potential contamination. It is anticipate that building demolitions will primarily generate non-hazardous construction debris with the exception of ACM and LBP. Such structures will be sampled and analyzed to determine the appropriate disposal facility. Mitigation of ACM includes removal and disposal prior to demolition.

Underground storage tanks (USTs) would be addressed as project design advances. A magnetometer survey will be conducted prior to construction if an UST is suspected on site, and all removal and site assessment activities will follow Ecology's Underground Storage Tank Statute and Regulations (Chapter 90.76 RCW, Chapter 173-360A WAC).

Three types of environmental media may require special consideration during construction: soil, groundwater, and surface water. Known areas of contaminated soil, groundwater, and surface water may be encountered within areas of planned construction. Off-site treatment and off-site disposal are typical remediation options for each of the three environmental media, as well as construction debris.

Pre-construction soil characterization would allow WSDOT to appropriately address soil management and disposal requirements in contract requirements, such as developing and implementing a Soil Management Plan, and contaminated media contingency plan. The purpose of this plan is to identify procedures and chains of responsibility to effectively manage contaminated soil as it is encountered during construction so that construction delays can be kept to a minimum.

Mitigation measures to minimize potential impacts to surface water resources include erosion and spill prevention controls. The plans will specify control methods, emergency response, notification, and chain of command. A Spill Prevention Control and Countermeasure (SPCC) Plan is required to be developed for the project. The SPCC plan would be designed to mitigate impacts to soil, surface water, and groundwater. This plan will address procedures, equipment, and materials used in the event of a spill and shall be supplied by contractors. To ensure worker and public health and safety, proper employee training, contaminated media contingency planning, and secondary containment for hazardous materials will be required of the contractor

FHWA and WSDOT will determine the appropriate strategy to prevent contamination of Hylebos Creek from the B&L Woodwaste site during final design, in collaboration with the Department of Ecology.

4.10 Visual Quality

Affected Environment

The affected environment relative to visual quality described in Section 3.9.2 of the 2006 FEIS, remains applicable to the proposed Phase 1 improvements. The visual character of a project area consists of the built and natural environment as perceived by residents, area workers, and those traveling through the area on the freeway or other roads. Since 2006, there have been increases in commercial and industrial development in the valley and within the project area resulting in decreases in agricultural use.

In 2001, a Visual Quality study was conducted by WSDOT in accordance with The United States Department of Transportation, FHWA publication Visual Impact Assessment for Highway Projects, 1988. That study was the basis for the 2006 Tier II FEIS documentation. The method for evaluating visual quality was based on objective descriptions used to quantify the visual impacts. The three criteria used to perform an appraisal of the landscape visual quality included vividness, intactness and unity. Each of the three criteria were independent and each was intended to evaluate one aspect of visual quality. For each criterion, the evaluator assigned a rating from 10 to 0 for very high to very low, respectively.

In January 2015 the U.S. Department of Transportation, FHWA published "Guidelines for the Visual Impact Assessment of Highway Projects". The document provides guidelines to assess the visual impacts of highway projects and to produce a visual impact analysis by defining the area of visual effect, examining the visual quality, and evaluating the degree of impact (Adverse, Neutral, or Beneficial) of a project. The qualitative methods described in the 2015 document are comparable to the quantitative methods used for the visual assessment for the 2006 FEIS. Both the 2006 FEIS visual assessment and the 2015 guidelines by the FHWA use geographic units grouped along the project route on which impacts on visual character and visual quality are assessed. These geographic units share similar visual resource characteristics and are called "Landscape Units" (LUs). Within the Landscape Units, "Key Views" are established which encompass views both of and from the project area.

Key Views

The 2006 FEIS described four distinct landscape units, LU1 – LU4. Figure 3.9-1 from the 2006 FEIS shows the boundaries of the landscape units. The 2006 FEIS also identified the visual resources and key views within each landscape unit. The quality of the key views were rated for existing (2006) and proposed (Build Alternative) conditions. Since completion of the Tier II FEIS in 2006, a number of characteristics changed within the project corridor. These included increase in vacant land development, Port of Tacoma expansion, and Tribal property expansion. The four Landscape Units and the Key Views described in the 2006 FEIS remain applicable to the Phase 1 Improvements (Exhibit 4.10-1).

Landscape Unit 1 – (SR 509 to SR 99)

Proposed Phase 1 Improvements: Transition from agricultural use to industrial and commercial development has continued at a rapid pace since 2006. Other than the bluffs, most of the open land is developed, or being developed. A few residential areas remain, scattered between the warehouses and commercial buildings and parking lots. As commercial buildings and warehouses have moved in, some streets have been landscaped with trees, blocking the large structures, but also blocking the more expansive views of the bluff and Mount Rainier.

- KEY VIEW 1 – Looking Northeast. Vicinity of Alexander Avenue and SR 167/509 interchange: This view has changed with industrial and commercial development in this vicinity since 2006, however there are still open view across field dominated by grasses and Scotch broom. Bluff and Mount Rainier visible with Port of Tacoma, some commercial buildings to the north and south and street trees planted on south side of SR 509.

- KEY VIEW 2 – Looking South. This view remains disjointed. Some structures and trees have been removed, while some volunteer indigenous trees, Scotch broom and blackberries have established in the vacant lots.

Landscape Unit 2 – (I-5 Vicinity)

Proposed Phase 1 Improvements: Conditions in this LU remain the same as documented in the 2006 FEIS. Some previous buildings and businesses are now vacant lots.

- KEY VIEW 1 – Looking East. This view remains similar to the conditions described in the 2006 FEIS, with the exception of former businesses replaced by empty lots.

Landscape Unit 3 – (I-5 to SR 161)

Proposed Phase 1 Improvements: Since 2006 there has been substantial increase in commercial and industrial complexes, and large 2-story warehouses have degraded most of the agricultural feel of the valley.

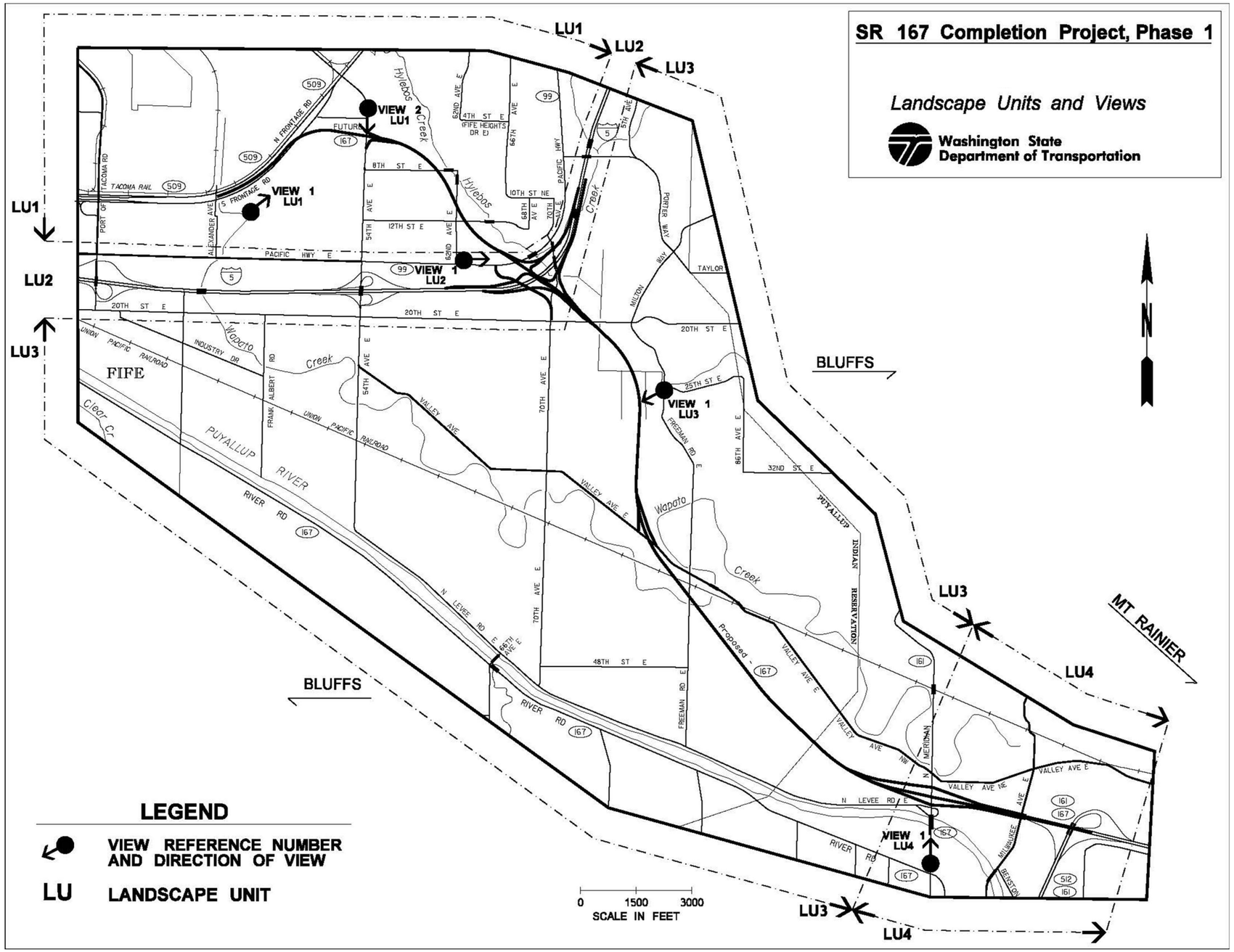
- KEY VIEW 1 – Freeman Road E looking west. Most views across the valley are now limited with large warehouse buildings, commercial and industrial complexes blocking them as compared to the FEIS views. Intactness and unity are now low.

Landscape Unit 4 – (SR 161 to SR 512)

Proposed Phase 1 Improvements: Conditions in this LU remain the same as documented in the 2006 FEIS.

KEY VIEW 1 – This view remains similar to the conditions described in the 2006 FEIS.

Exhibit 4.10-1. Landscape Units and Views for the Proposed Phase 1 Improvements



Effects during Operation

For this Re-evaluation, the visual quality impacts of the proposed SR 167 Phase 1 Improvements include effects associated with the Phase 1 alignment right of way as well as the impacts associated with the RRP areas and potential wetland mitigation sites. The analysis found that the proposed SR 167 Phase 1 Improvements result in limited change to the amount of visual impacts that would occur as compared to the 2006 FEIS Build Alternative.

The visual impacts in the four Landscape Units described in the 2006 Tier FEIS remain applicable to the Phase 1 Improvements, and compare as follows:

Landscape Unit 1 – (SR 509 to SR 99)

Proposed Phase 1 Improvements: The new proposed Phase 1 Improvements would still be built on a raised embankment. The visual impacts are anticipated to be similar to those described in the 2006 FEIS.

Landscape Unit 2 – (I-5 Vicinity)

Proposed Phase 1 Improvements: The new Phase 1 Improvements would include a Diverging Diamond interchange. This will reduce the three levels of overpass (described in the 2006 FEIS) to one level, minimizing the visual impact substantially. Views from nearby hillside homes and I-5 would still have negative visual impacts due to the raised embankment and overpasses. However the new visual line element would lessen (reduce) the overall impact to vividness, intactness, and unity compared to the 2006 Build Alternative.

Landscape Unit 3 – (I-5 to SR 161)

Proposed Phase 1 Improvements: This alignment would still be built on a raised embankment throughout this Landscape Unit and would still be the dominant, linear feature in this viewshed. However, the viewshed is no longer flat because it is currently (as of 2018) dominated with large warehouse buildings, commercial and industrial complexes, and the increased industrial character have already created negative impacts on the shrinking agricultural viewshed. The proposed Phase 1 interchange at Valley Avenue E has a smaller footprint than the 2006 Build Alternative, and would have a smaller impact than the 2006 Build Alternative, but the proposed improvements would still add to traffic with increased nighttime vehicle lights, and roadway luminaires, and would add to the negative impacts that have been increasing in this Landscape Unit. The addition of the raised roadway with interchange ramps would alter the compositional visual pattern and have an overall negative impact however, the lines of the roadway would provide a sense of continuity along the valley floor.

Landscape Unit 4 – (SR 161 to SR 512)

Proposed Phase 1 Improvements: The new proposed Phase 1 Improvements would still be built on a raised embankment. The visual impacts are expected to be similar to those described in the 2006 FEIS.

While increased man-made impacts since 2006 have led to the current degradation of the proposed SR 167 Phase 1 corridor, the elevation, scale, and length of the project would dominate this area of the valley. The elevated embankment would give the appearance of a levee running through the corridor, creating a visual barrier dividing the valley. As with any roadway, lights and glare associated with a new highway at night would also create a negative impact to all LU's in the current alignment.

Effects during Construction

Consistent with the discussion in Section 3.9.3 (page 3-247) of the 2006 FEIS, visual impacts of construction under the proposed Phase 1 Improvements are considered temporary in nature, therefore only impacts described above during operations phase are relevant.

Mitigation

Mitigation during operations for the 2006 FEIS Build Alternative refer to the "Roadside Classification Plan" (WSDOT 1996) as a guideline for roadside restoration and mitigation for the project. This involves blending architectural elements with the roadway structures, minimizing the use of luminaires and using low lighting to lessen the impact from glare, using wall fencing or vegetation to screen car movement on the roadway and glare. Vegetation is recommended in many areas to bring the roadway and its structures to a human scale, screen for glare, and soften views away from and towards the dominant linear element within the landscape.

The Roadside Classification Plan has been replaced with the "Roadside Policy Manual" (WSDOT, August 2015), and the Roadside Manual. Mitigation treatment for visual impacts in the Roadside Policy Manual and the Roadside Manual is the same as mitigation treatment in the Roadside Classification Plan. Therefore mitigation during operations for the proposed Phase 1 Improvements would be consistent with what was described in the 2006 FEIS, Section 3.9.4 (page 3-257) with some changes in the planting palate for the areas considered "Urban" per the Roadside Policy Manual. These changes include reducing the amount of shrubs and groundcover planted within the proposed planting areas and replacing them with native grasses. It is WSDOT Policy to remove the minimum amount of desirable vegetation necessary to complete the project. It is also WSDOT policy to replace trees removed by a project at various replacement ratios based upon diameter of trunk at breast height (dbh) removed. Replanting with trees will still be a component of the roadside restoration within "Urban" areas and the entire corridor.

One new goal of the updated planting scheme for the Phase 1 Improvements is to address increased homeless encampment pressures that urban areas are currently encountering. Planting these areas with shrubs and groundcovers would provide visual screens that serve as hiding places for homeless camps and/or illegal activities to occur in many instances. The new planting plan to include more native grasses mixed with trees versus shrubs and groundcovers is anticipated to minimize this problem.

Conclusion

Visual quality impacts from the new proposed SR 167 Phase 1 Improvements are consistent with, or reduced compared to the extent of impacts identified in the 2006 FEIS. No new significant effects would result from the Phase 1 alignment and design features. WSDOT would plant native vegetation along the proposed Phase 1 alignment corridor and interchanges consistent with the WSDOT Roadside Policy Manual to blend the new project alignment and interchanges into the existing landscape, while enhancing the natural harmony, cultural order, and project coherence.

The alignment for Phase 1 Improvements decrease the amount of native vegetation to be impacted as compared to the impacts documented in the 2006 FEIS. This change in impact to existing vegetation would reduce the amount of re-planting and plant establishment associated with the project in various locations along the alignment. The SR 167 Phase 1 Improvements would not result in any new significant impacts compared to the 2006 Build Alternative. See also Attachment J, Visual Quality Technical Memorandum.

4.11 Public Services

Affected Environment

This Re-evaluation examines changes to the existing public services from what was described in Section 3.10.2 of the 2006 FEIS. The study area evaluated included one mile on either side of the center-line of the Phase 1 Improvements alignment and is shown in Exhibits 4.11-1 through 4.11-3 below. This corresponds with the study area described in the 2006 FEIS which encompassed the City of Fife, the northernmost portions of the City of Puyallup, and instances where service boundaries overlap with surrounding communities. The public services reviewed include education, government and social institutions (including churches, community centers, day care facilities, and social service providers), medical services (including hospitals, medical and dental clinics, and nursing homes), fire and police stations, cemeteries, and recreation. Several new public services were identified which had not previously been identified in the 2006 FEIS including a private school, Puyallup City Hall, food bank, medical and dental clinics, and nursing homes. All the most recent public services in the study area are described in the sections below.

Educational Facilities

Fife School District

The Fife School District boundaries are the same as described in the 2006 FEIS. No new schools have been constructed since the 2006 FEIS, however, enrollment has increased from 3,200 students to approximately 3,500 students.

As of 2017, bus transportation has increased with approximately 23 buses on 60 routes. Buses provide both morning and afternoon transportation to the elementary, middle, and high school students using many of the local arterials in the study area. Consistent with the 2006 FEIS, 54th Avenue E, N Levee Road, 70th Avenue E and 20th Street E are the primary school bus routes through the Fife valley. The majority of school bus trips occur on 20th Street E, as this street is the most widely used corridor connecting the eastern and western halves of the school district.

Puyallup School District

As described in the 2006 FEIS, the Puyallup School District serves the Cities of Puyallup and Edgewood while sharing most of its northern boundary with the Fife School District. Of the district's 32 schools serving more than 22,500 students, four are located within the study area. A fifth Puyallup school, Hilltop Elementary, was included in the 2006 FEIS study area; however, this school has since closed. As discussed in the 2006 FEIS, the primary bus routes within the study area include Valley Avenue E, Freeman Road E, 24th Street E and SR 161 (Meridian Avenue).

Other Educational Facilities

In addition to the Fife and Puyallup School District, since the 2006 FEIS, there is one new private school in the study area. The Fife campus of the All Saints Catholic School is located at 2323 54th Avenue E. At this campus the school provides pre-school through 2nd grade education.

Government Facilities

Government facilities located within the study area include the Fife City Hall (5411-23rd Street East), the Milton City Hall (1000 Laurel Street), and the Puyallup City Hall (333 S Meridian). Fife City Hall was the only government facility identified previously in the 2006 FEIS study area. The Milton City Hall may not have been identified within the 2006 FEIS because it is located outside of the previous study area boundaries and the Puyallup City Hall was not identified because it was not constructed until after completion of the 2006 FEIS.

Churches

No churches were identified in the 2006 FEIS. Five churches are currently located in the study area, these include:

- New Horizon Christian Center, located at 5600 Valley Avenue E
- St. Martin of Tours Parish, located at 2303 54th Avenue E
- St. Paul Chong Hasang Parish, located at 1316 62nd Avenue E
- Seed of Life Baptist Church, located at 6905 10th Street E
- Christ Episcopal Church, located at 210 5th Street SW

Community Centers

Consistent with the 2006 FEIS, the Fife Senior/Community Center and the Puyallup Recreation Center are the two community centers located in the study area. As of 2017, services at the Fife Senior/Community Center include classes, a swimming pool, health screening, seminars, and social functions. The City of Puyallup operates a recreation center with meeting rooms, dance area, gymnasium, workout area, outdoor fields and tennis courts.

Exhibit 4.11-1. Public Services – Map 1 of 3

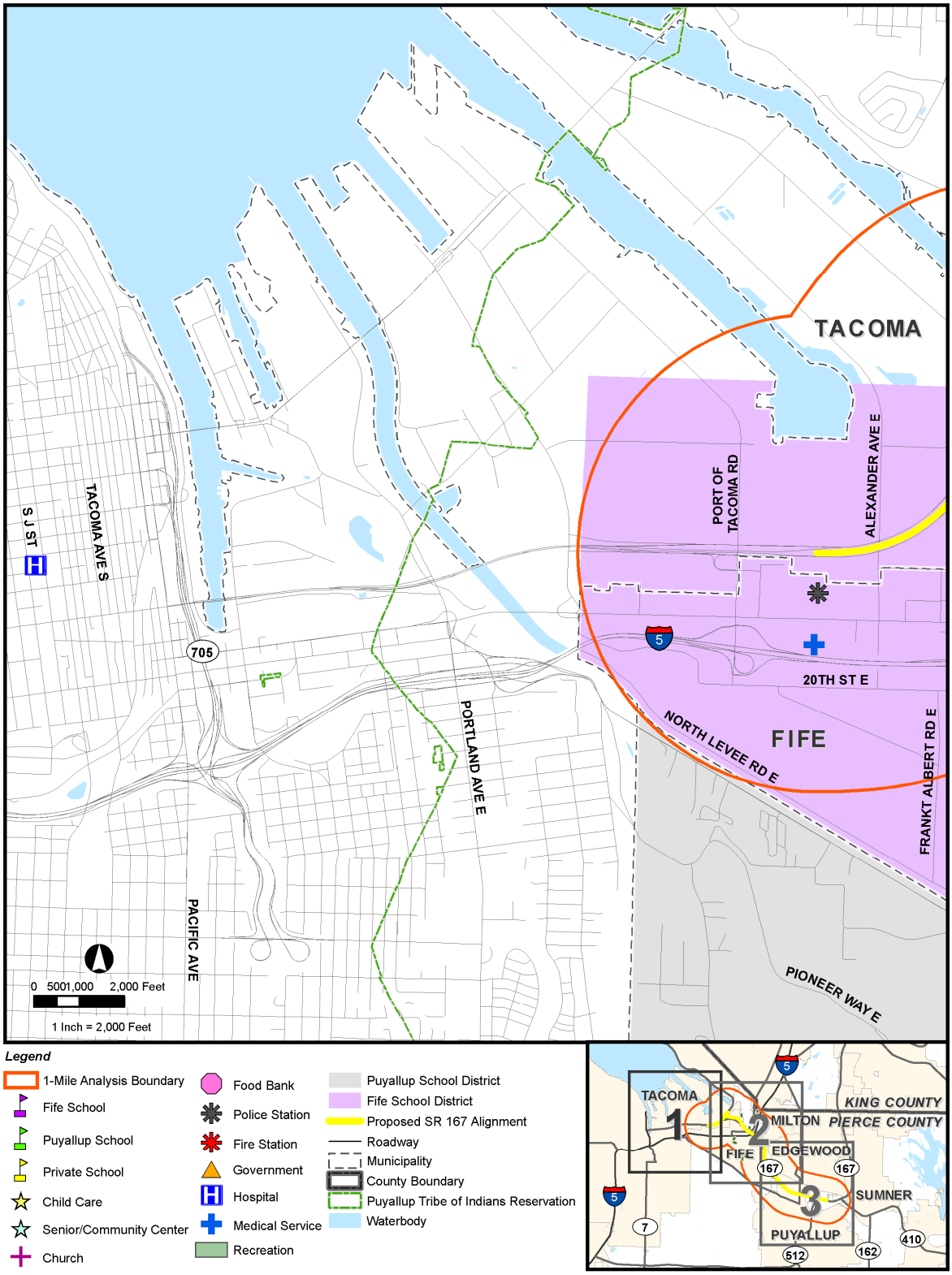


Exhibit 4.11-2. Public Services – Map 2 of 3

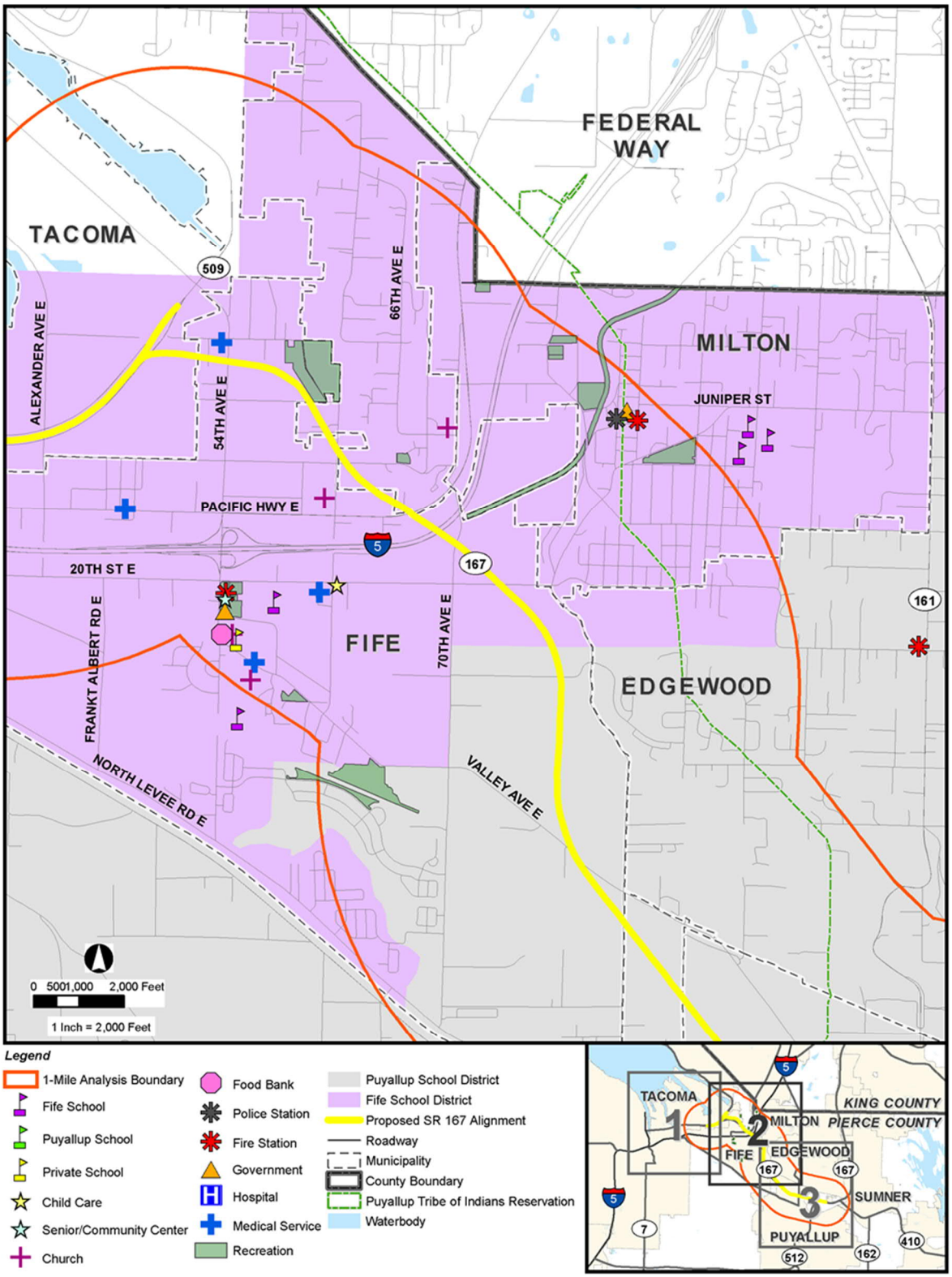
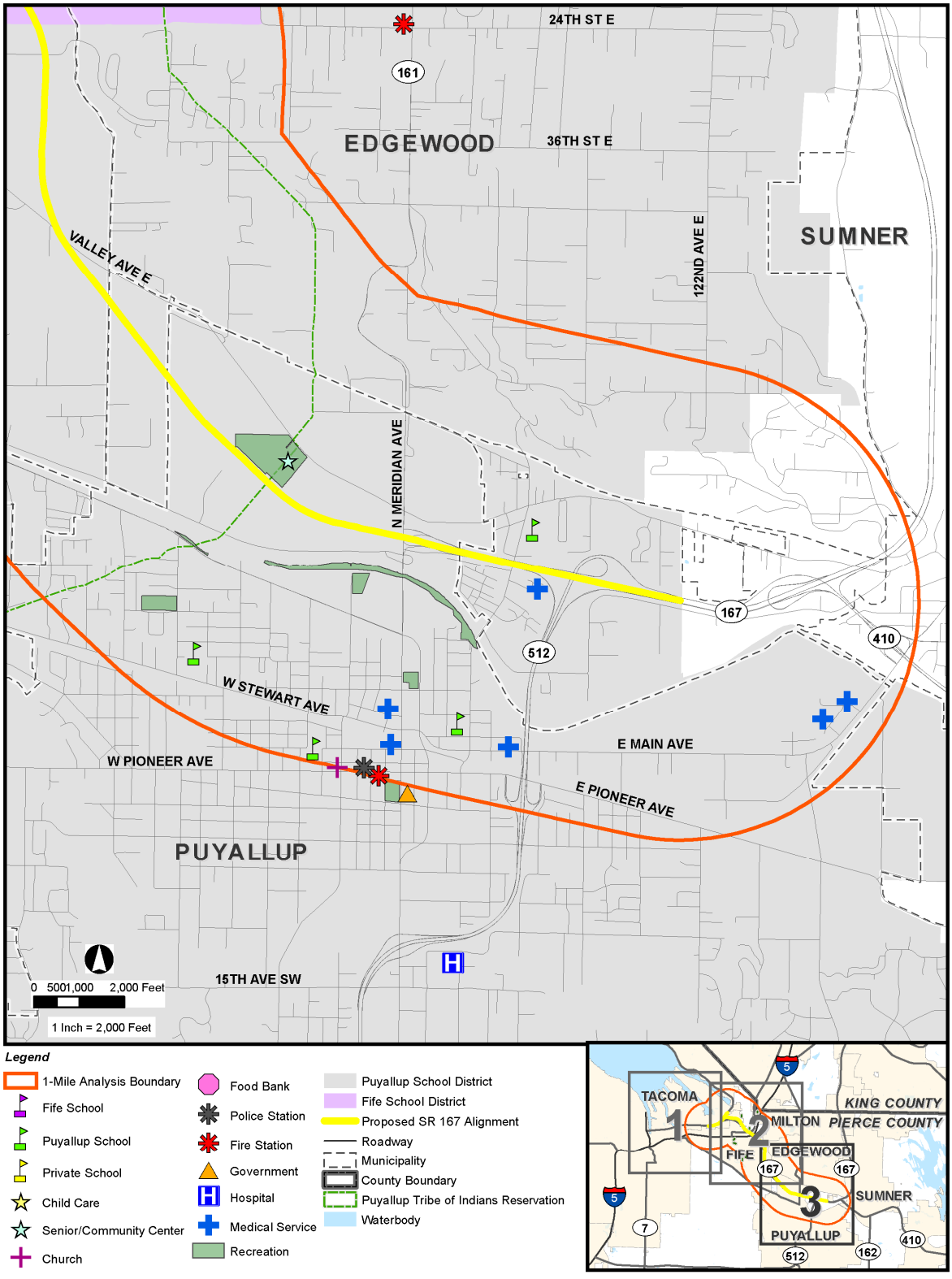


Exhibit 4.11-3. Public Services – Map 3 of 3



Day Care Facilities

No day care facilities were identified in the 2006 FEIS for the study area. Munchkinland Child Care, located at 6205 20th Street E, is the only day care facility located in the study area evaluated in 2017. The facility provides child care to Fife, Milton, and the surrounding communities.

Social Service Providers

The only social services provider in the study area is the Fife Milton Food Bank (which was not identified in the 2006 FEIS), located at 2303 54th Avenue E. The food bank is operated by the St Martin of Tours Parish.

Medical Services

As stated in the 2006 FEIS, major medical facilities that service the study area include St. Joseph's Medical Center in Tacoma and MultiCare Good Samaritan Hospital in Puyallup. The updated analysis for Re-evaluation determined additional medical clinics in the study area include:

- MultiCare Centers for Occupational Medicine, located at 502 54th Avenue E in Fife.
- Occupational Medical Clinic of Tacoma, located at 4703 Pacific Highway E in Fife.
- Salish Cancer Center, located at 3700 Pacific Highway E in Fife.
- Dove Medical Clinic, located at 801 E Main Avenue in Puyallup.

No dental clinics were identified in the 2006 FEIS. The 2017 analysis determined the following dental clinics are located with the study area:

- FME Family Dental, located at 6104 20th Street E in Fife.
- Distinctive Dentistry, located at 5615 Valley Avenue E in Fife.
- Puyallup Valley Dental Care, located at 2921 5th Avenue NE in Puyallup.
- Northwest Dental Medicine, located at 2903 E Main in Puyallup.
- Main Station Dental Care, located at 111 W Main in Puyallup.

No nursing homes were identified in the 2006 FEIS. There are now three nursing home facilities located within the study area in Puyallup and include the Brookdale Puyallup, Linden Grove Health Center, and a private nursing home type facility located on Morningside Drive adjacent to the onramp to SR 512.

Fire and Police

Firefighting/Emergency Services

Consistent with the 2006 FEIS, most of the fire suppression and emergency medical services in the study area are provided by the Tacoma Fire Department, since there is a service agreement between them and the City of Fife. As identified in the 2006 FEIS, the Tacoma Fire Station No. 12 serves the study area. The Puyallup portion of the study area is served by Central Pierce Fire and Rescue, while the cities of Milton and Edgewood are served by East Pierce Fire and Rescue (Exhibits 4.11-1 through 4.11-3).

Police

As stated in the 2006 FEIS, the major portion of the study area is served by the Fife Police Department. The department maintains coverage for the entire area bounded by the Fife city limits. The Fife police department is located at 3737 Pacific Highway E in the study area.

The Puyallup Police Department (311 W Pioneer Avenue, Exhibits 4.11-1 through 4.11-3) serves a small segment of the southern section of the study area. The Milton Police department (1000 Laurel Street,

Exhibits 4.11-1 through 4.11-3) serves the City of Milton while the Pierce County Sheriff's department serves the City of Edgewood as well as unincorporated Pierce County.

Recreation

The parks and recreation facilities in the study area are (Exhibits 4.11-1 through 4.11-3) listed below by city. Those facilities not identified in the 2006 FEIS are also noted below.

City of Fife

- Fife community swimming pool.
- Fife High School.
- Fountain Memorial Park.
- Colburn Park (not identified in 2006 FEIS).
- Centennial Park.
- Dacca Park.
- Wedge Park.
- 5-Acre Park (not identified in 2006 FEIS).
- Brookville Gardens Community Park. The park is planned to open in the fall of 2017.
- Hylebos and Milgard Nature Areas (Milgard Nature Area was not identified in the 2006 FEIS).

Note, the City of Fife's proposed National Soccer Park that was identified in the 2006 FEIS to be located within the study area was terminated by the City in 2007.

City of Puyallup

- City of Puyallup recreation center.
- Grayland Park (not identified in 2006 FEIS).
- Puyallup Skatepark (not identified in 2006 FEIS).
- Puyallup Riverwalk Trail (not identified in 2006 FEIS).

City of Milton

- Milton Community Park (not identified in 2006 FEIS).
- Interurban Trail, located at 70th Avenue.
- West Milton Nature Preserve (not identified in 2006 FEIS).

Effects during Operation

WSDOT's proposed Phase 1 Improvements would not result in any new or substantial impacts beyond those discussed for the 2006 FEIS Build Alternative. No community facilities would be displaced as a result of Phase 1 Improvements. Changes in access are not expected to affect any public services. In operations phase, school buses, police, fire, and emergency vehicles would be provided with an additional route option in providing services. In addition, the SR 167 Phase 1 Improvements would reduce traffic, including freight truck traffic on local roads. With less heavy industrial traffic on local arterials, historically congested streets would no longer impede emergency vehicles or access to and from public services and recreational facilities. It is anticipated that access would improve, and travel times are expected to decrease in the project area compared to current conditions. Emergency service response times to residential areas are also expected to improve.

Consistent with the 2006 FEIS, although the proposed new SR 167 freeway would bisect service areas, there is no anticipated need to change any service area boundaries or provide additional facilities. The Phase 1 Improvements would not result in any major arterial closures as the new freeway would bridge over all major arterials that it would cross. A few local access roadways, however, would be eliminated or cul-de-saced. These smaller roads are: 53rd Avenue E, 8th Street E, 9th Street Court E, 10th Street Ct E, 62nd Avenue E, 65th Avenue E., and 67th Avenue E. These roadways currently provide access to land that is either WSDOT owned or anticipated to be acquired by WSDOT for ROW.

Two streets, 53rd Avenue E and 8th Street E, would be shortened and a cul-de-sac provided for turnaround. 53rd Avenue E is a dead-end street and several of the businesses along it would be acquired as part of the project. As it currently exists, 8th Street E connects with 62nd Avenue East; however, once the Phase 1 Improvements are constructed, 62nd Avenue E would no longer exist north of 12th Street E. Both 65th Avenue and 67th Avenue are currently dead end streets. Both of these streets would be eliminated with the project as all the surrounding property would be purchased for the project. There are no public services located along these roadways.

Currently there is also a roadway bridge over Hylebos Creek on 8th Street E, which pedestrians use to make a loop on the Hylebos Creek Nature trail and the Milgard Nature trail. The project would remove that roadway bridge and replace it with a pedestrian bridge so that the loop is maintained.

There are no direct effects on recreational facilities anticipated as a result of the Phase 1 Improvements. Additional information on recreational facilities is provided in Section 4.19 of this Re-evaluation and Attachment S, Section 4(f) Evaluation.

Effects during Construction

The effects of the proposed Phase 1 Improvements on public services during construction are consistent with what was described for the 2006 FEIS Build Alternative. There are no public facilities such as hospitals, schools, and police departments located within the project corridor nor would any public facilities be separated from the community they serve by the project. Access to these facilities and their services would not be halted by construction, however use of alternative routes may be necessary during periods of construction. Rerouting and disruptions in access could temporarily impact emergency service providers such as ambulance, police, and fire protection, as well as school bus routes especially when traveling through construction areas.

Some existing facilities would be temporarily impacted due to traffic control and road closures. Once the project is completed, traffic patterns would re-establish themselves based on the revised road system.

Mitigation

Similar to the 2006 FEIS Build Alternative, no mitigation measures are proposed or necessary during the operation phase of the Phase 1 Improvements.

Mitigation measures during construction of the proposed Phase 1 Improvements are consistent with those described for the 2006 FEIS. Impacts on fire, emergency, and police services during construction will be limited to temporary disruptions of service routes within the construction zone. Service providers affected by construction will be notified in advance of the construction period. Police, fire and emergency response, school districts, and educational facilities will be notified of construction schedules, access restrictions and possible detour routes prior to access modification.

The scheduling of road closures and detour routes will be coordinated with police fire, and emergency services, school districts, educational facilities, and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will

conform to state and local regulations. Restricting lane closures and construction activities that impact traffic during peak commuter-hours and peak holiday travel periods will help minimize backups and delay times. WSDOT will maintain open communications to help keep local residents informed of development phase, areas of construction, and possible travel alternatives.

Conclusion

Consistent with the mitigation measures in Section 3.10.6 of the 2006 FEIS, no new significant impacts on public services from construction and operation would occur as a result of the proposed Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures are necessary or would be required. See also Attachment K, Public Services Technical Memorandum.

4.12 Utilities

Affected Environment

This Re-evaluation addresses public and privately-owned utilities, including electric, natural gas and other fuels, telecommunications, water, sewer, stormwater, and solid waste collection services.

The affected environment relative to utilities described in Section 3.10.2 of the 2006 FEIS remains applicable to the proposed Phase 1 improvements. The following sections describe changed conditions, or new information relative to utilities and the affected environment.

Applicable Regulations and Procedures

The design of all utility relocations required for the Phase 1 improvements would adhere to the latest applicable utility regulations and WSDOT standards. The WSDOT Utilities Manual has been revised 8 times since November of 2004, and the revisions encompass all chapters of the manual, including provisions for utility agreements, accommodations, environmental permitting and control zone guidelines.

Telecommunications

Although the telecommunications provider Comcast was not specifically included in the 2006 FEIS, coordination with Comcast and analysis to support this Re-evaluation has occurred during the design phase for the Phase 1 Improvements. Comcast provides wire line and fiber telecommunications service throughout the SR 167 Completion Project Phase 1 Improvements area. These facilities include overhead and buried communication lines.

Stormwater

In 2012 the City of Fife constructed a new stormwater pond as part of the City's 70th Avenue E Roadway Improvement project, which was not included in the 2006 FEIS. The stormwater pond is located on the west side of 70th Avenue E, north of 20th Street E. The city obtained an interagency agreement to construct this facility within WSDOT right of way. The pond would be impacted by this project.

Sewer

In 2010 a new sanitary sewer force main was constructed by the City of Fife along 20th Street E from Freeman Road to 70th Avenue E. The force main was installed to serve new buildings constructed along Freeman Road. Impacts on this utility are not anticipated since the profile and alignment of 20th Street E would not be changed with the Phase 1 Improvements.

In 2012 a new sanitary sewer force main was constructed by the City of Fife along Valley Avenue E from 70th Avenue E to Freeman Road. The force main was installed as part of a Local Improvement District (LID) to serve existing and future buildings along Valley Avenue E. Impacts on this utility are not anticipated since the profile and alignment of Valley Avenue E would not be changed with the Phase 1 Improvements.

Water

In 2010 a new water main has been constructed by the City of Fife along Valley Avenue E, however impacts on this utility are not anticipated since the profile and alignment of Valley Avenue E would not be changed with the Phase 1 Improvements.

Effects during Operation

Based on the proposed Phase 1 Improvements design footprint compared to the 2006 FEIS design, a net reduction in substantial utility impacts is anticipated. The reduction of the SR 167 Phase 1 project

footprint compared to the 2006 FEIS Build Alternative, along with the realignment and removal of some roadway elements included in the Build Alternative would reduce the overall impacts on utilities.

The proposed Phase 1 Improvements reduce the alignment length at SR 509 between Port of Tacoma Road and Alexander Way, and at I-5 between 54th Avenue E and 62nd Avenue E.

There is also a location where the project elements included in the 2006 FEIS have been already been constructed, which reduces the corresponding utility relocation impacts. This is the SR 167 Puyallup River Bridge Replacement Project (new bridge crossing of SR 161 over the Puyallup River) which was completed in 2015.

New and reduced impacts on utilities are described further below.

New Utilities and Anticipated Impacts Summary

Water

The City of Fife's Benthien Loop Water Main Extension Project would expand the City's water system between 54th Avenue E and 57th Avenue E. A portion of the project would provide a water main connection along 56th Avenue E that would extend across the Phase 1 right of way in a north-south direction. Construction of the project is scheduled to begin in 2018. The project would require a WSDOT Utility Permit, and mitigation is anticipated to include casing of the new water line within WSDOT right of way along with supporting geotechnical data that takes into account the future loading from the highway embankment. WSDOT would continue to coordinate with the City of Fife as the design of the water main project progresses.

Natural Gas and other Fuels

Puget Sound Energy (PSE) Liquid Natural Gas Facility and Pipeline

PSE is building a new liquefied natural gas (LNG) facility along the Hylebos Waterway at the Port of Tacoma. The facility is currently targeted for completion in 2019 and would include improvements to the existing PSE natural gas distribution system. PSE's Pipeline Segment A is part of the planned distribution system improvements within the Port of Tacoma, City of Tacoma, City of Fife, and unincorporated Pierce County (per the PSE's Proposed Tacoma LNG Facility Environmental Impact Statement). Pipeline Segment A would cross the SR 167 Phase 1 Improvements alignment at 54th Street E and also be installed near the Phase 1 alignment at the intersection of 12th Street E and 62nd Avenue E. The PSE pipeline would continue south within 62nd Avenue E to the south side of I-5 before ending at the intersection of 62nd Avenue E and 20th Street E. It is not anticipated that the pipeline would be impacted by the SR 167 Phase 1 Improvements.

Utility Impact Reductions

Electrical Utilities

A reduction in impacts and anticipated relocations to existing overhead electrical lines and towers would result from the reduced footprint of the Phase 1 Improvements.

Effects during Construction

The temporary construction effects discussed in the 2006 FEIS remain applicable to the proposed SR 167 Phase 1 Improvements, except as noted below.

Electrical Utilities

A reduction in impacts and anticipated relocations to existing overhead electrical lines and towers would result from the reduced footprint of the Phase 1 Improvements. Specifically, the 110-kV line that crosses

the proposed alignment between Alexander Avenue and 54th Avenue E would not be impacted by the Phase 1 improvements.

Natural Gas and Other Fuels

A reduction in impacts and anticipated relocations noted in the FEIS to existing gas lines would result from the reduced footprint of the Phase 1 Improvements. Specifically, approximately 5,000 linear feet of the Olympic Pipeline that runs parallel to the northbound lanes of I-5 would not be impacted by the Phase 1 improvements.

Telecommunications

A reduction in impacts and anticipated relocations noted in the 2006 FEIS to existing telecommunication lines would result from the reduced footprint of the Phase 1 Improvements. Specifically, in the 20th Street E vicinity, since the proposed roundabouts noted in the FEIS are no longer included in the Phase 1 Improvements, thus the buried cables would not be impacted.

As discussed in Section 3.10.3 of the 2006 FEIS, utility impacts would be closely evaluated during the SR 167 Phase 1 design phase and a determination made on whether or not to relocate the utility facilities. The final number of relocations would depend on the final design of the mainline and each interchange.

Mitigation

Similar to the Build Alternative described in Section 3.10.4 of the 2006 FEIS, no utility impacts associated with operation of the proposed SR 167 Phase 1 Improvements would require mitigation. All potential impacts will be addressed during the SR 167 Completion Project Phase 1 Improvements design, permitting, and construction phases. All utility relocations of services will be finished, and temporary service facilities removed before completion of construction.

The mitigation measures during construction as described in Section 3.10.6 of the 2006 FEIS remains applicable to the SR 167 Phase 1 Improvements. The commitments noted in the SR 167 Extension Project's Record of Decision (ROD), Attachment A Tier II FEIS Commitments List [FHWA, October 2007] remain applicable to the Phase 1 project. A net reduction in utility impacts compared to the 2006 Build Alternative is anticipated to reduce the mitigation requirements related to utility impacts from the proposed Phase 1 Improvements.

Mitigation for impacts on the stormwater pond located on the west side of 70th Avenue E, north of 20th Street E from WSDOT's Phase 1 Improvements will be determined during the stormwater facility design process.

Conclusion

The SR 167 Completion Project's affected area of Phase 1 is smaller than the 2006 FEIS affected area. With adherence to current regulatory requirements, no new significant impacts would occur to utilities from construction and operation of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures would be required. See also Attachment L, Utilities Technical Memorandum.

4.13 Land Use and Socioeconomics

Affected Environment

The proposed SR 167 Project Phase 1 Improvements would occur within the same jurisdictions that were discussed in the 2006 FEIS, including:

- City of Tacoma/Port of Tacoma
- City of Fife
- City of Puyallup
- City of Milton
- City of Edgewood
- Unincorporated Pierce County
- Puyallup Tribe of Indians

City of Tacoma / Port of Tacoma

Land Use

Consistent with the 2006 FEIS, the northern terminus of the Phase 1 Improvements fall within the Tacoma City limits where they would connect with SR 509 near the Port of Tacoma.

Since the 2006 FEIS there have been some notable changes to the land located at the end of the Blair Waterway. This land was described as vacant land, log storage, auto import storage, and warehouse/packaging in the 2006 FEIS and has since become a new major container terminal called the Pierce County Terminal. The Port of Tacoma also opened the 146.5-acre Marshall Avenue Auto Facility and opened other major new facilities including redeveloping and expanding the Husky Terminal and completing the Olympic Container Terminal. Zoning for the Port of Tacoma land has not changed since the 2006 FEIS, except for the M-3 and M-2 (Heavy Industrial) designations which have revised to Port Maritime and Industrial (PMI). The PMI District is intended to allow all industrial activities that are not permitted in other districts. There is also a Manufacturing/Industrial Center (MIC) overlay that was established in the Puget Sound Regional Council's (PSRC) VISION 2040 Plan and the City of Tacoma's Comprehensive Plan. The MIC overlay is a designation that protects the manufacturing and industrial uses and targets the area for substantial regional employment growth. One of the larger development projects near the project area is located at 4801 E 8th Street; the Prologis Port of Tacoma Building D Project, has recently been constructed and includes approximately 320,000 square foot warehouse building and related site improvements.

The changes described above are depicted in Exhibit 4.13-1.

Exhibit 4.13-1. Port of Tacoma, 2017



Areas where Industrial/Commercial Development occurred since 2006

Population Characteristics and Housing

The population in the City of Tacoma has increased between 2000 and 2010; growth that is consistent with what was described in the 2006 FEIS. Over the past decade, the percentage of minority population has grown along with overall population growth. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 296,918 in the year 2035, a growth of 34 percent over 2010 estimates (PSRC 2015).

Economic Activity

Today, the Port of Tacoma is the 23rd largest among all United States ports and is still a major landowner within the City of Tacoma. The Port continues to operate and lease substantial piers, docks, wharves, cargo handling equipment, and related upland facilities and continues to be home to Tacoma and Pierce County's highest concentration of industrial and manufacturing activity.

As was the case in 2006, the Port serves as a major economic engine for Pierce County, creating thousands of family-wage jobs and serving as a catalyst for continued economic development. In 2013, Port of Tacoma maritime cargo and industrial lease activity generated 29,110 direct, induced and indirect jobs as compared to the 22,000 jobs referenced in the 2006 FEIS. Since 2006, salaries for direct employees of the Port have increased to an average salary of $57,492 per year, about 65 percent more than the county median earnings for workers. Statewide, over 266,800 jobs were related to cargo moving via the Port of Tacoma marine terminals. Maritime activity at the Port of Tacoma marine terminals generated about $76.1 million in local taxes in Pierce County (Port of Tacoma 2014).

Since the 2006 FEIS, employment at the Port of Tacoma has decreased but the makeup of jobs remains consistent. The highest percentage of jobs at the Port, as expected, are and continues to be in the manufacturing, wholesale trade, transportation, and utilities sectors. In addition, as of 2015, the number of jobs at the Port of Tacoma are expected to increase on into 2035. Employment for the Port of Tacoma is projected to increase in all the sectors except for the government sector; with the largest growth anticipated in the retail sector.

Beyond the Port of Tacoma, the City of Tacoma supports a variety of economic activities and has strong and increasing employment numbers. Employment in the City of Tacoma is expected to increase from 104,759 jobs in 2015 to 162,323 jobs in 2035. Job growth in this sector is expected to continue for the year 2035 (55.6 percent). Retail and construction and resources jobs are also expected to increase in the City of Tacoma in 2035, 18.3 percent and 3.3 percent respectively.

According to the 2011–2015 American Community Survey 5-year Estimates the City of Tacoma has a 56.9 percent employment rate. Major employers in the city include local public-school districts, MultiCare Health System, Washington State Employees, Franciscan Health System, Pierce County Government, Washington State Higher Education, City of Tacoma, Emerald Queen Casino, Walmart, Costco, and Tacoma Public Utilities.

Income

Income levels in the City of Tacoma have also continued to increase since the 2006 FEIS, from a median household income that was $37,879 in 2000 to a current median household income of $52,042.

Tax Revenue

Tax revenue generated from property and economic activity in the City of Tacoma plays a major role in revenues for the city's general fund. Sales and business taxes make up 42 percent of the general funds total revenues.

Consistent with the 2006 FEIS, industrial and commercial property values along the development corridor are expected to increase as new developments and relocations compete for the small amount of available frontage space along the existing highway corridors (I-5 and SR 99). Commercial properties within the project corridor are valued from $1.36 to $46 per square foot for vacant commercial land in during the time period of 2015-2018. Improved commercial properties within the project corridor characteristically bring between $85,000 to more than $6,800,000 per site. Properties closest to the I-5 corridor typically demand the highest value.

Transportation

Transportation challenges have not improved for the Port of Tacoma since the 2006 FEIS. Today, truck traffic is traveling between the Port and warehousing and distribution centers located in the Kent Valley, Fife/Puyallup/Sumner, Tacoma, Frederickson, DuPont, Lacey/Olympia, and Centralia/Chehalis. The existing SR 167 is the primary freeway connecting the Kent and Puyallup River valleys to the Seattle/ Tacoma/Bellevue metropolitan area.

City of Fife

Land Use

Consistent with the 2006 FEIS, the majority of the Phase 1 Improvements would occur within the Fife city limits. Since the 2006 FEIS, the amount of agricultural and vacant land adjacent to the Project's Phase 1 alignment has diminished and industrial/commercial has increased. Exhibits 4.13-1 through 4.13-4 each show a current aerial photo that identifies areas where major industrial development has occurred since the 2006 FEIS. These new developments have occurred in areas that were once predominantly agricultural and vacant/undeveloped land. This land has become more industrialized with manufacturing and warehouse/distribution facilities replacing farmland. Development has also been especially prevalent between 70th Avenue E and the proposed SR 167 alignment and between Freeman Road E and the proposed SR 167 alignment.

Since 2006, there has been new industrial and commercial development including Sound Analytical Services, Odom Corporation, Fife Landing North, and Rushforth Construction Company's office building. The zoning in this area has not changed since 2006 and continues to be industrial (I) and commercial (RC and CC).

The southeastern part of Fife contains industrial developments that have occurred since 2006 as well as agriculture lands and a number of single family homes that existed in 2006. The city's current comprehensive plan notes that these residences are at risk of being displaced by commercial or industrial development because they are easily accessible to the area's transportation network.

Exhibit 4.13-2. Fife and Milton (I-5 to SR 509), 2017

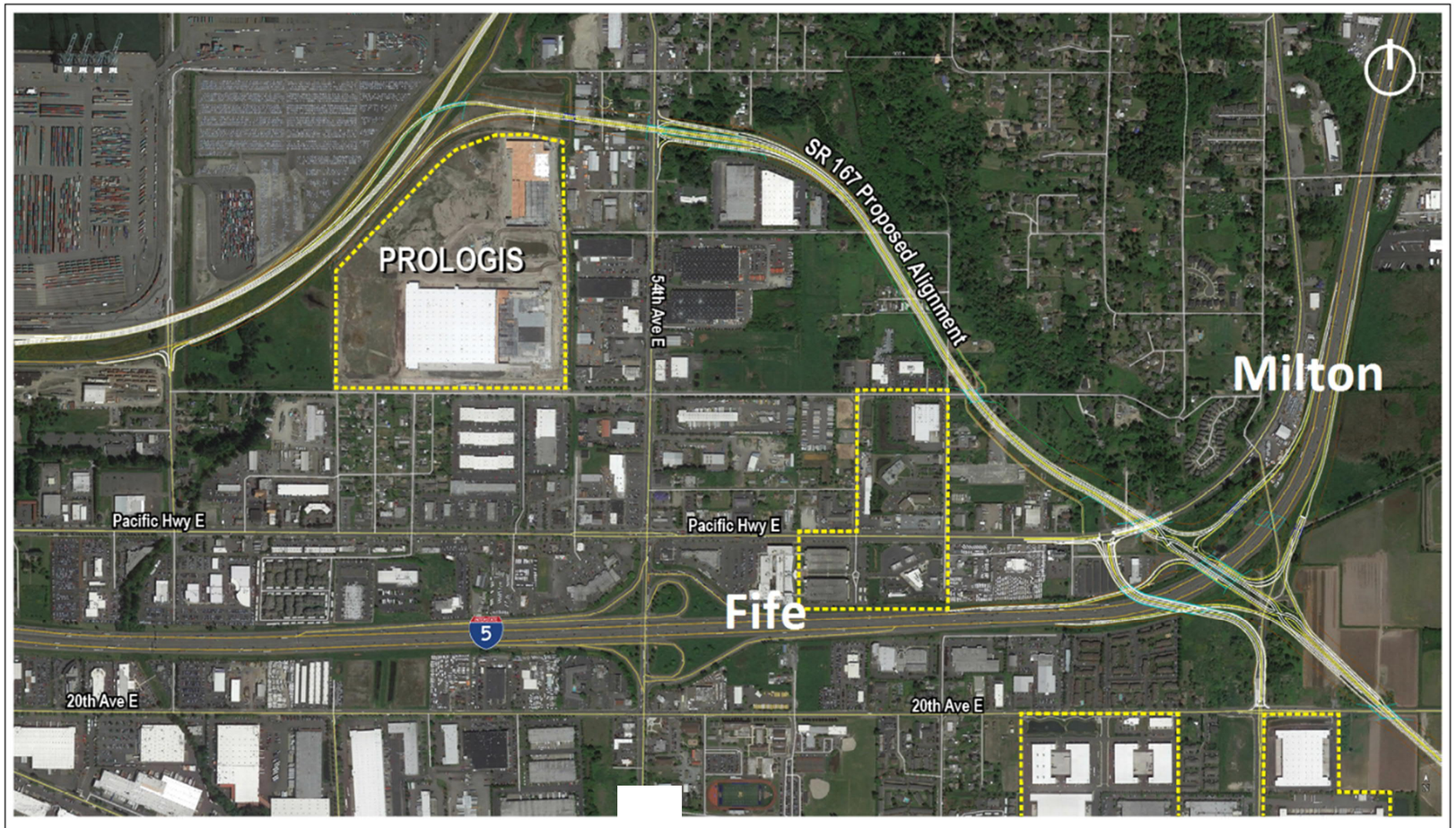
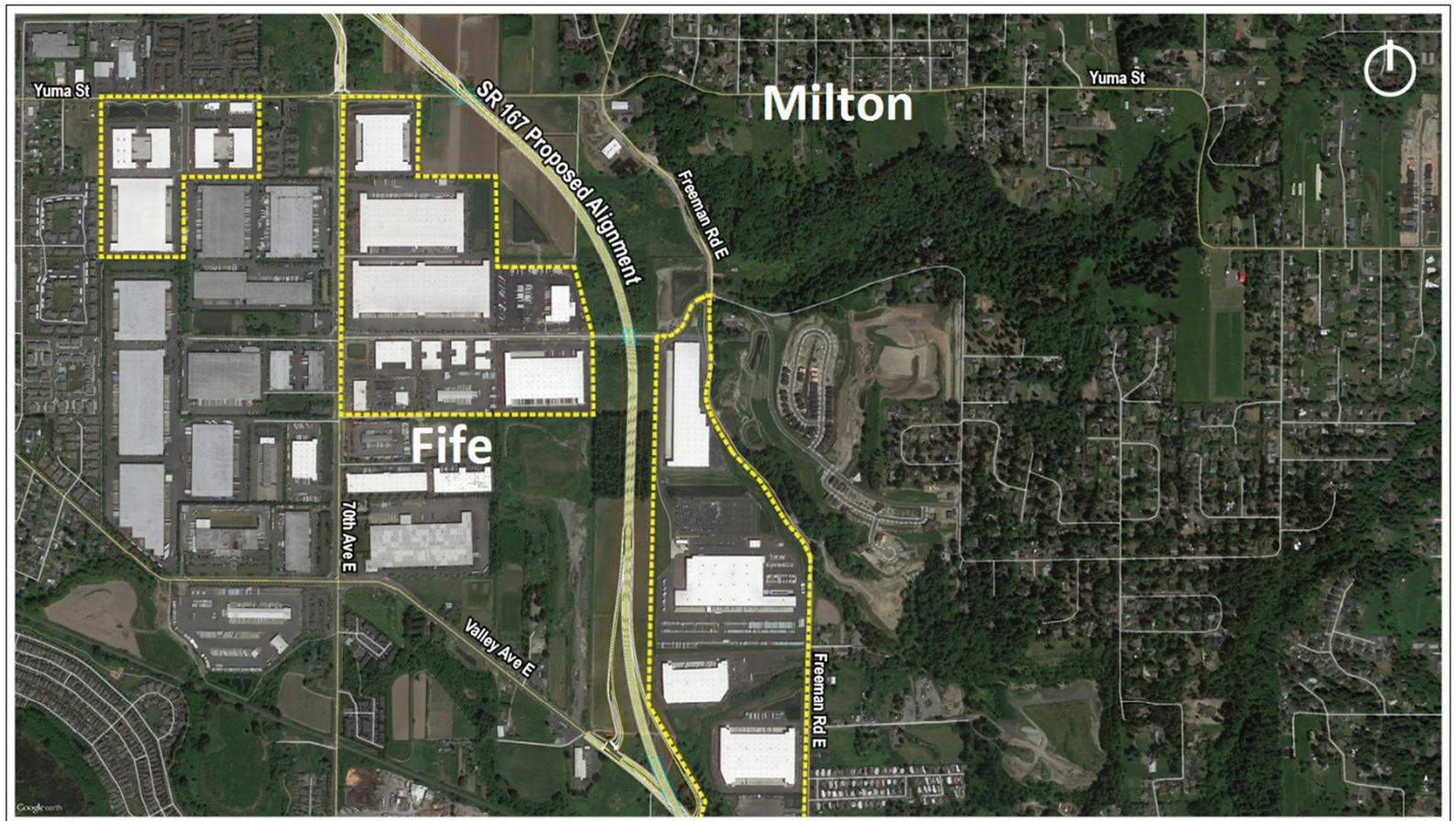
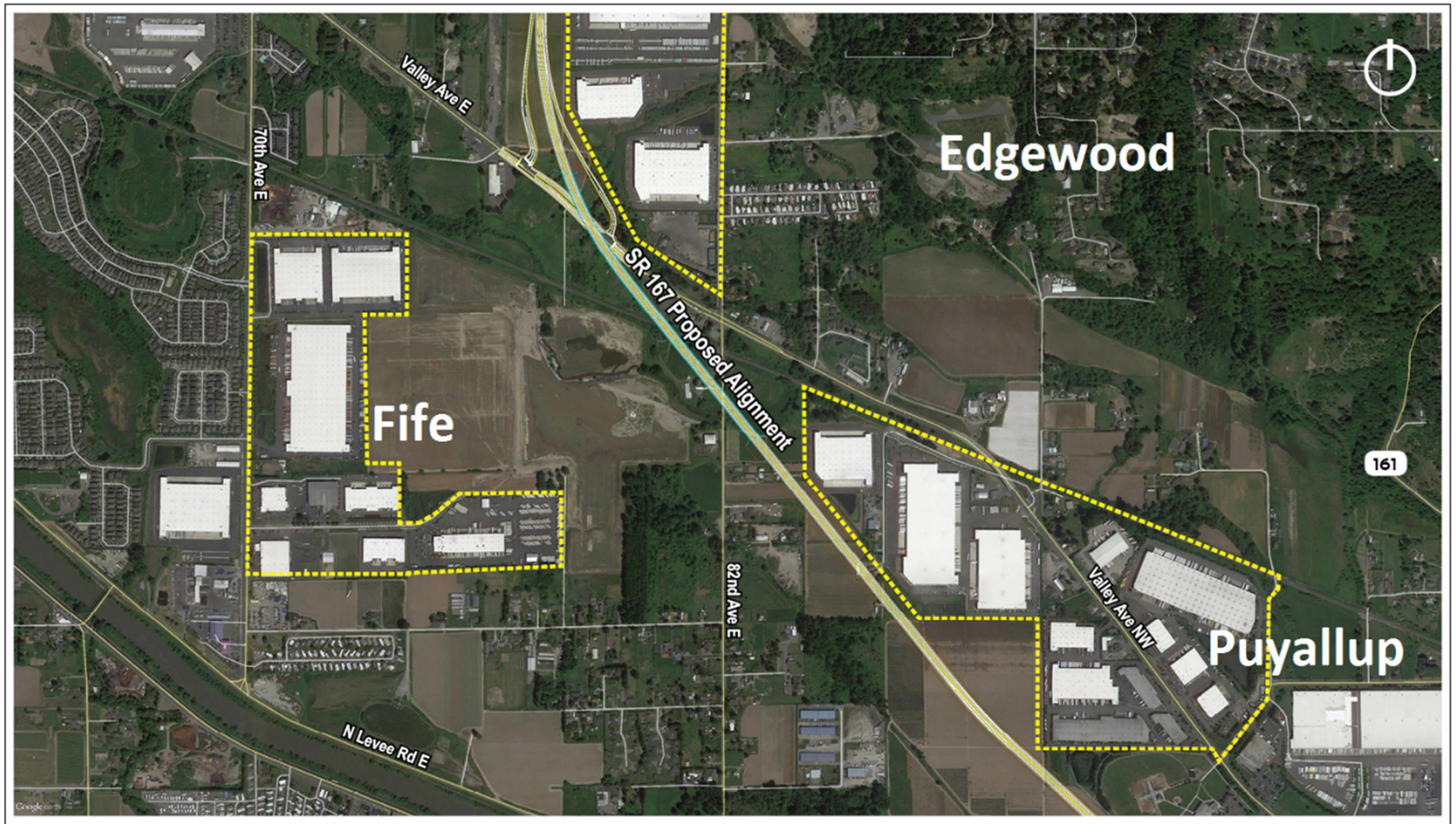


Exhibit 4.13-3. Milton and Fife (Fife I-5 to Valley interchange), 2017



Areas where Industrial/Commercial Development occurred since 2006

Exhibit 4.13-4. Puyallup and Milton (Valley interchange), 2017



Consistent with the 2006 FEIS, zoning in Fife in the area adjacent to the SR 167 corridor has remained for industrial and commercial use. The City of Fife has several development projects which are in review, permitted and/or have been constructed near the project area including:

- Freeman Road project (under construction)
- US Foods project, 2204 70th Avenue E (under construction)
- Lakeridge Industrial Development, 6815 26th Street E.
- New Sound Transportation project, 7495 26th Street E.
- Van Halder project, 520 54th Avenue E.
- 8th Street Warehouse project, 5306 7th Street E.
- Trammell Crow, 2502 Freeman Road.

Population Characteristics and Housing

The population in the City of Fife has almost doubled between 2000 and 2010; growth that is consistent with what was described in the 2006 FEIS. Over the past decade, the percentage of minority population has grown along with overall population growth. The City of Fife experienced a 13.8 percent increase in minority population. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 11,684 in the year 2035, a growth of 27 percent (PSRC 2015).

Economic Activity

The City's location and visibility from I-5 and Highway 99 has not changed since the 2006 FEIS and continues to attract industrial uses. The composition of manufacturing employment in Fife is similar to but greater than 2006 and reflects the City's unique location in proximity to the Port of Tacoma and the type of business the City has attracted as a result.

The largest current and projected employers in Fife are in the manufacturing and wholesale trade, transportation, and utilities sector. The composition of employment in Fife is different than Pierce County, where the largest employment sector is finance, insurance, real estate, and services. Fife's total employment is projected to increase from 12,793 in the year 2015 to 18,008 by the year 2035, or by 41 percent.

According to the 2011-2015 American Community Survey 5-year Estimates the City of Fife has a 64.6 percent employment rate, which is higher than Pierce County (56.6 percent). Major employers in the city include Milgard, Mission Foods, American Fast Freight, Continuant, Costco Wholesale Corp, Gensco Inc., Emerald Queen Hotel & Casino, FedEx Freight, Motel 6, Odom Corporation, Pexco LLC, Comcast, Smith Fire Systems, United Postal Service, US Foodservice, Valdo's Catering, and Prologis Distribution Services.

Income

Income levels in the City of Fife have continued to increase since the 2006 FEIS, from a median household income that was $31,806 in 2000 to a current median household income of $55,603.

Tax Revenue

Approximately 63.8 percent of the City of Fife's general fund is made up of tax revenue. Of that 63.8 percent, 32.2 percent is generated from sales tax.

Transportation

Consistent with the findings of the 2006 FEIS, today the movement of people and goods within and through Fife play a role in determining land use patterns. The City's proximity to the Port of Tacoma, the City of Tacoma, south King County and major employment areas, plus its accessibility to the interstate highway system has not changed since 2006 and continues to support the planned industrial growth in the area. These factors make the Fife area road network one of the most heavily traveled in Pierce County.

City of Puyallup

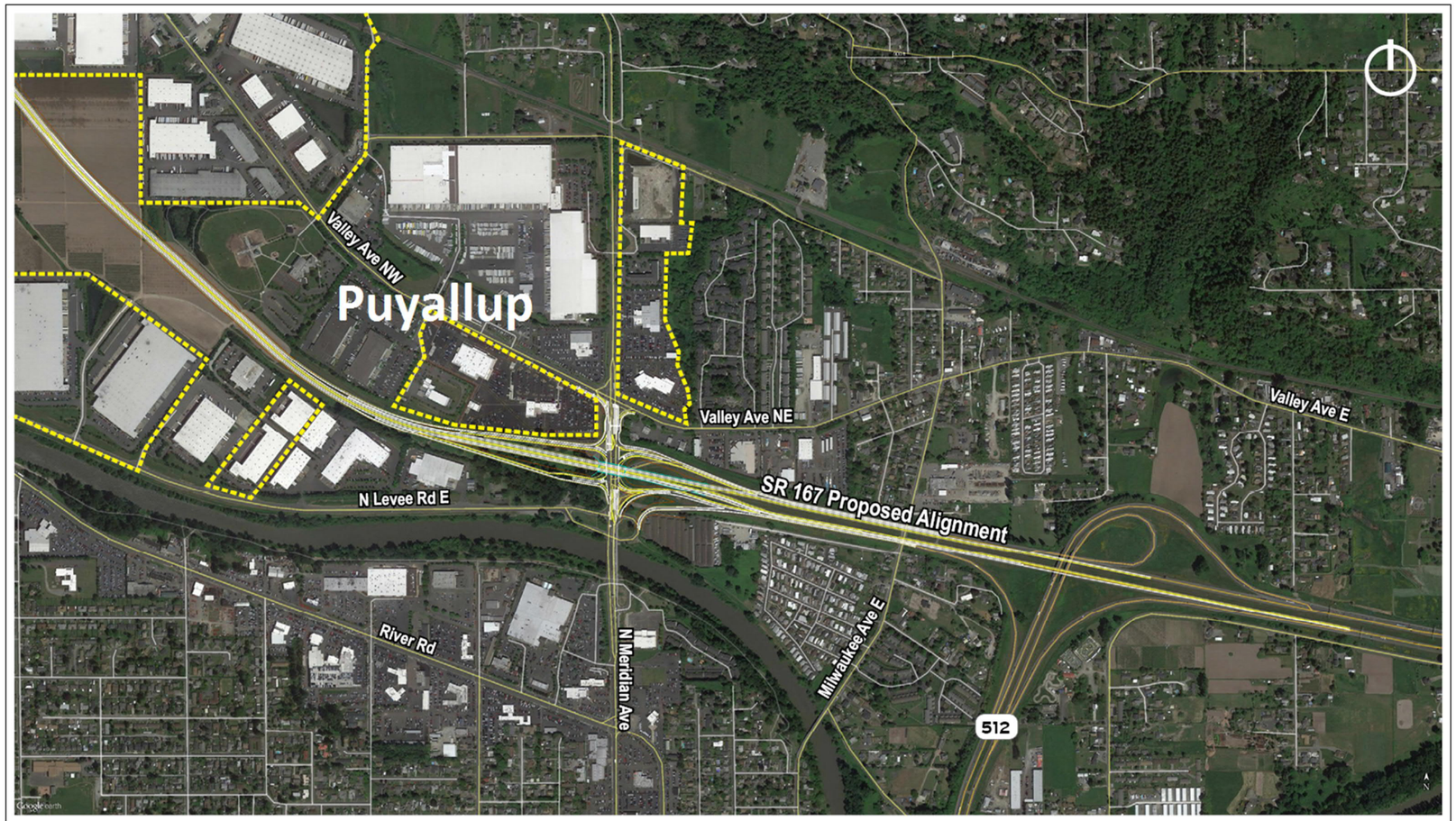
Land Use

Consistent with the 2006 FEIS, the Phase 1 Improvements are located within the northern section of the City of Puyallup east of Freeman Road to just west of the current terminus of SR 167 at SR 161. A city recreation center (ball fields) located in the North Puyallup area on Valley Avenue sits adjacent to and north of the Phase 1 Improvements. Exhibit 4.13-5 shows a current aerial that identifies where recent development has occurred within the project area within the City of Puyallup. As shown, the agricultural land uses adjacent to the Phase 1 Improvements has changed into land uses consistent with the City's "Limited Manufacturing" zoning. Large swaths of land have been developed into industrial and manufacturing areas that have required substantial space, and have been converted from agricultural lands.

Puyallup zoning is currently ML (Limited Manufacturing) in the section adjacent to the Puyallup River and consists of light industrial facilities and warehouses. The rest of the North Puyallup area is zoned CG (General Commercial), which permits multi-family housing development of 10 to 20 units per acre. The Agriculture Overlay (AGO) zone is intended to ensure that agricultural lands within these areas are treated sensitively to the location of and pressures from surrounding urban development. It is the intent of this zone to encourage the continuation of agricultural activities as defined herein until such time that these lands are needed for urban uses. It is also the intent of this zone to protect agricultural activities from zoning and nuisance complaints.

At this time, there are no notable development projects in City of Puyallup in review, permitted and/or that are currently underway near the SR 167 Project Phase 1 alignment.

Exhibit 4.13-5. Puyallup (Meridian interchange), 2017



Population Characteristics and Housing

The population in the City of Puyallup has increased about 13 percent between 2000 and 2010; growth that is less rapid than what was described in the 2006 FEIS. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 58,347 in the year 2035, a 58 percent increase (PSRC 2015).

Based on data provided by the 2010 U.S. Census, occupancy and vacancy rates in the City of Puyallup closely mirror those of the county as a whole; 92.1 percent of all units are occupied leaving a 7.9 percent vacancy rate. Homeowner vacancy rates in the city are 2.6 percent with rental vacancy rates being 8.5 percent. The average household size for the City of Puyallup is 2.5.

Economic Activity

Puyallup was once an agricultural community but more recently has become a regional commercial and service center for eastern Pierce County. Puyallup is a city with a convenient shopping district and a growing employment base. The City's location is central to the four-county Puget Sound region and its connection to SR 410 and SR 512 and SR 167 provide easy proximity to greater Puget Sound and its international ports. Puyallup also serves as the top boarding location for Sound Transit's "Sounder" commuter rail service to Tacoma, Seattle and Everett.

As a part of the last Comprehensive Plan update, the City of Puyallup has been planning for expected growth in employment over the next 20 years through 2035. Based on growth estimates from the PSRC, Puyallup is preparing for over 8,400 new workers by 2035. This is an expected 34 percent growth in employment.

Similar to Pierce County, the Finance, Insurance, Real Estate, and Services industry made up the single-largest portion of the jobs based in Puyallup in 2015. This trend is expected to continue in 2035, though with an increase of about 23 percent. Looking forward, employment growth in the retail and government: public employment sectors is expected in the City of Puyallup.

With heavily-used transportation corridors constricting both commuters and trade, regional mobility is a challenge for Puyallup and surrounding jurisdictions.

According to the 2011-2015 American Community Survey 5-year Estimates the City of Puyallup has a 59.4 percent employment rate. Major employers in the city include the Puyallup School District, Multicare/Good Samaritan Hospital, Fred Meyer Distribution Center, Comcast Cable, Costco Wholesale Store, Wal-Mart, CSK Automotive Distributors, Fred Meyer, City of Puyallup, and Western International Review Board.

Income

Income levels in the City of Puyallup have continued to increase since the 2006 FEIS, from a median household income that was $47,269 in 2000 to a current median household income of $63,376.

Tax Revenue

Tax revenue generated from economic activity in the City of Puyallup plays a major role in revenues for the City's general fund. Sales tax alone accounts for 55 percent of the general funds total revenues.

Transportation

Freight movement in Puyallup occurs primarily via the three state routes that serve the City; SR 161, SR 167 and SR 512. SR 512 is a grade-separated freeway throughout the entire extent of the City. SR 167 (existing River Rd.) connects Puyallup with the Port of Tacoma to the west and to a heavy industrial corridor north of Sumner. SR 161 connects SR 512 with the City's South Hill Center and points south of

the City. Valley Avenue is another major arterial that serves Puyallup's main industrial zone north of the Puyallup River.

City of Milton

Land use

A small northeast section of the project study area west and south of Porter Way along I-5, and also the existing 70th Avenue bridge and the Interurban Trail, is within the City of Milton. Consistent with the 2006 FEIS, the existing land use in this area is primarily single-family residential, commercial, and vacant land. The single-family homes are located on fairly large lots, with multifamily development creating a buffer to the commercial corridors along I-5 and SR 99. There has been no major land use development and conditions are similar to those in 2006.

The land adjacent to the Phase 1 Improvements remains zoned as Light Manufacturing District and Business District. The City of Milton has one development project in review near the SR 167 Completion Project Phase 1 Improvements alignment, the Telecare Residential Facility located at 7224 Pacific Highway E. The development includes construction of a 12,000-square foot, 16-bed residential healthcare treatment facility.

Economic Activity

As was the case in 2006, the total employment in the City of Milton is quite small when compared to other jurisdictions along the project corridor with only 1,933 jobs in 2015. This number is projected to increase to 2,156 jobs in 2035, an 11 percent increase. Similar to Pierce County, the majority of jobs in Milton in 2015 were in the finance, insurance, real estate, and services sector. Projections for 2035 show this industry sector remaining a strong area for jobs. The highest job growth in Milton is projected to be in the manufacturing and wholesale trade, transportation, and utilities sector, followed by the retail sector. It is also anticipated that jobs in the areas of construction and resources, government, and education would all experience decreases in 2035.

Income

Income levels in the City of Milton have continued to increase since the 2006 FEIS, from a median household income that was $48,166 in 2000 to a current median household income of $66,050.

Tax Revenue

Tax revenue generated from economic activity in the City of Milton contributes to the City's general fund. Sales tax makes up 21 percent of the general funds total revenues.

Transportation

Interstate 5 and State Route 99 (Pacific Highway) intersect the City's western portion, and State Route 161 (Meridian Street East) creates the City's eastern most boundaries. Milton Way is the primary east/west route through the City and intersects the City Town Center. These corridors serve both local and regional needs. The City has designated Milton Way as a truck route from 20th Street E. to Meridian Avenue E. Pacific Highway E. and Meridian Avenue E. serve as Milton's north-south freight corridors. Trucks also use arterial roadways that connect to industrial and commercial areas.

City of Edgewood

Consistent with the 2006 FEIS, the SR 167 Project's Phase 1 alignment does not travel through Edgewood but would provide a key connection for the N. Meridian Avenue. The current land use in the City of Edgewood adjacent to the study area in the vicinity of Freeman Road and N. Meridian Avenue is primarily residential. Zoning in this area is Single-Family (low and moderate) and Mixed-Residential (low

and moderate). Exhibit 4.13-4 shows land uses in the southern portion of Edgewood are still primarily agriculture.

Pierce County

Adjacent to the cities of Fife and Tacoma east of 54th Avenue E, a small portion of unincorporated Pierce County lies within the study area. This includes land bound by 62nd Avenue E on the west, SR 99 to the south and Hylebos Creek on the northeast. This area consists mainly of single-family residential and vacant land with commercial land use along the north side of Pacific Highway. This is an older neighborhood of small lots located between Hylebos Creek and 62nd Avenue E. Zoning is designated as Moderate Density Single Family and Mixed-Use District by Pierce County. Located directly north of the bluffs above Hylebos Creek is Fife Heights, a largely residential community with a rural character.

The SR 167 Project's Phase 1 Improvements cross two additional areas of unincorporated Pierce County, one bounded by Freeman Rd E and 86th Avenue E, south of Valley Avenue E and north of Levee Rd E; and a second in the "North Puyallup" area east of Milwaukee Avenue E, encompassing the SR 167/SR512 interchange. The first area contains a mix of single-family residences and industrial development. The area is zoned as Employment Center. The second area is primarily residential with a few small-scale industrial uses. This area is zoned for high density single-family uses. No major land use changes have occurred since 2006.

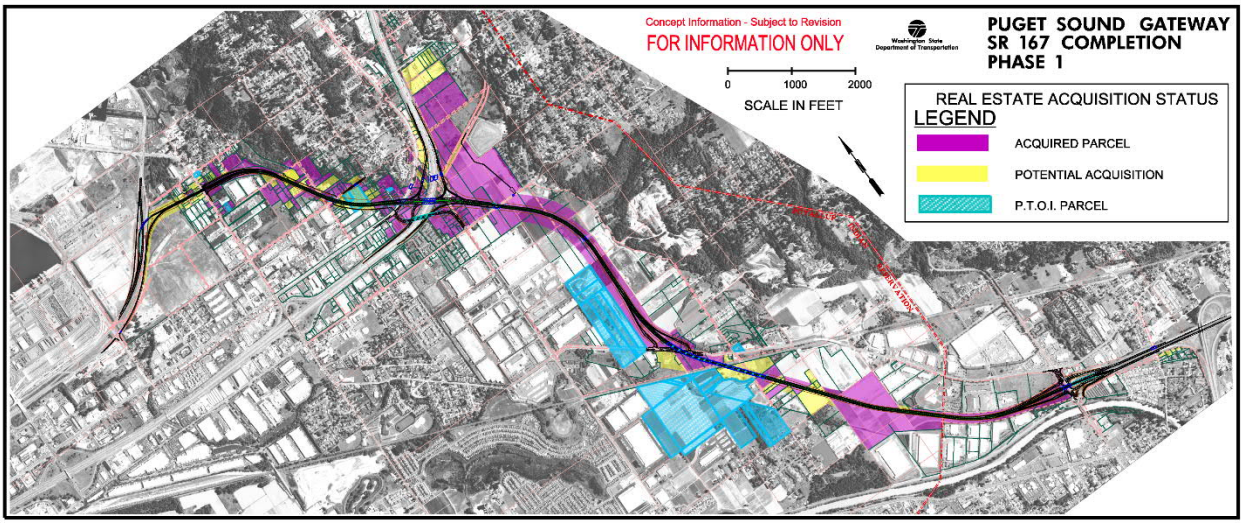
Puyallup Tribal Trust Lands

Puyallup Tribe of Indians (PTOI) "Trust Lands" within the study area are shown on Exhibit 4.13-6.

Tribal Trust Lands in the study area are located north and south of Valley Avenue between 70th Avenue E and 82nd Avenue E, as well as in the Port of Tacoma/Fife area north of I-5. Trust Lands located within the vicinity of the proposed SR 167 Phase 1 alignment includes eight parcels of land (41 acres) west of the proposed project Right of Way (ROW) and east of 70th Avenue E, two parcels (15 acres) southwest of the proposed ROW at the intersection of Freeman Road and 48th Street, one parcel south of the proposed ROW on 8th Street E at 54th Avenue E (0.34 acre), one parcel north of the proposed ROW on 4th Street E at 54th Avenue E (.034 acre), and two parcels east of 62nd Avenue E and south of 12th Street E (5 acres).

Since publication of the 2006 FEIS, the PTOI have purchased the Dekeyser Farm property (approximately 100 acres) south of the Burlington Northern Santa Fe (Union Pacific Railroad) railroad tracks and west of Freeman Rd and east of 70th Avenue E.

Exhibit 4.13-6. Vicinity Map - Parcel Acquisition Status and Puyallup Tribal Trust Properties



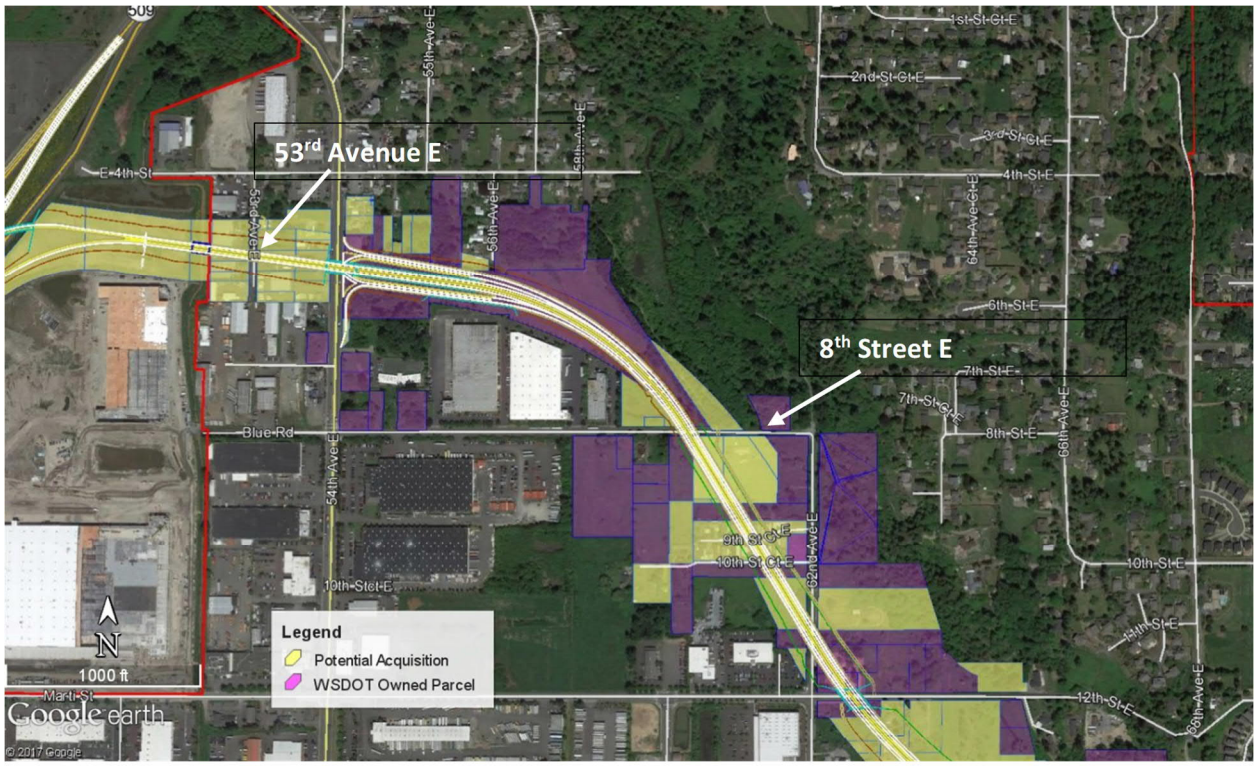
Effects during Operation

The Phase 1 Improvements would not result in any new or substantial impacts during operation. Consistent with the 2006 FEIS, the SR 167 Project's Phase 1 Improvements would not affect the regional economy, except through beneficial effects of transportation efficiency in the SR 167 corridor. Overall the effects from investments in transportation infrastructure would be beneficial to businesses and consumers because of improved accessibility. Factors that influence accessibility include travel times, safety, and the transportation choices available to users. In particular, businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit.

Changes in Local Access

A few local access roadways that currently provide access to land that is either WSDOT owned or anticipated to be acquired for ROW would be cul-de-saced as a result of the Phase 1 Improvements. Two streets, 53rd Avenue E and 8th Street E, would be shortened and a cul-de-sac provided for turnaround. As shown in Exhibit 4.13-7, 53rd Avenue E is a dead-end street and several of the businesses along it would be acquired as part of the project. Similarly, 8th Street E currently connects with 62nd Avenue East; however, once Phase 1 Improvements are constructed 62nd Avenue E would no longer exist north of 12th Street E, therefore a cul-de-sac would be constructed where 8th Street E. intersects the new highway right of way.

Exhibit 4.13-7. Location of 53rd Avenue E and 8th Street E in Study Area



Source: Google Earth 2017

Construction of the new 70th Avenue E tie-in to SR 99 is shown on Exhibit 4.13-8. This tie-in would result in the vacation of 65th Avenue E. A three-story building that is located in the southwest corner of this intersection currently utilizes 65th Avenue E to access a parking lot located behind the building. WSDOT's design is being developed, in coordination with the City of Fife, that would provide access to this back-parking lot utilizing the not yet vacated 65th Avenue E right of way.

Exhibit 4.13-8. Location of 65th Avenue E and 70th Avenue E in the Study Area

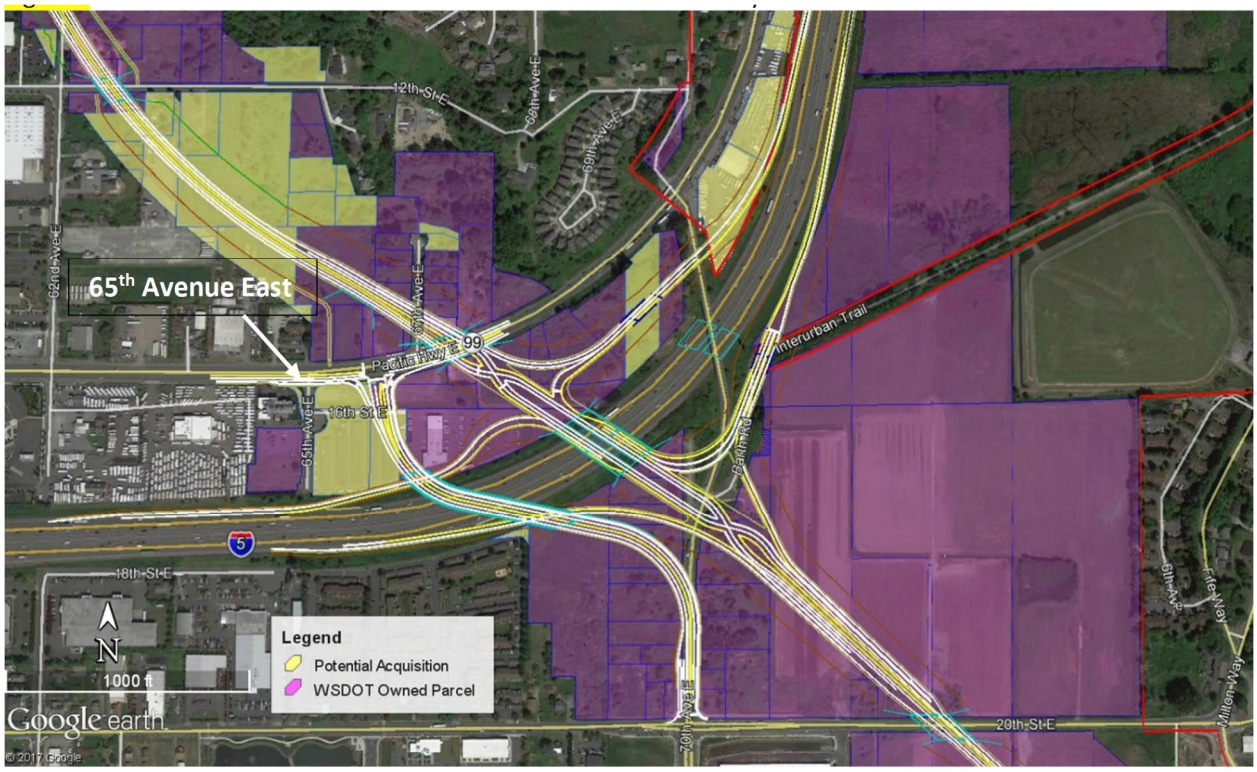
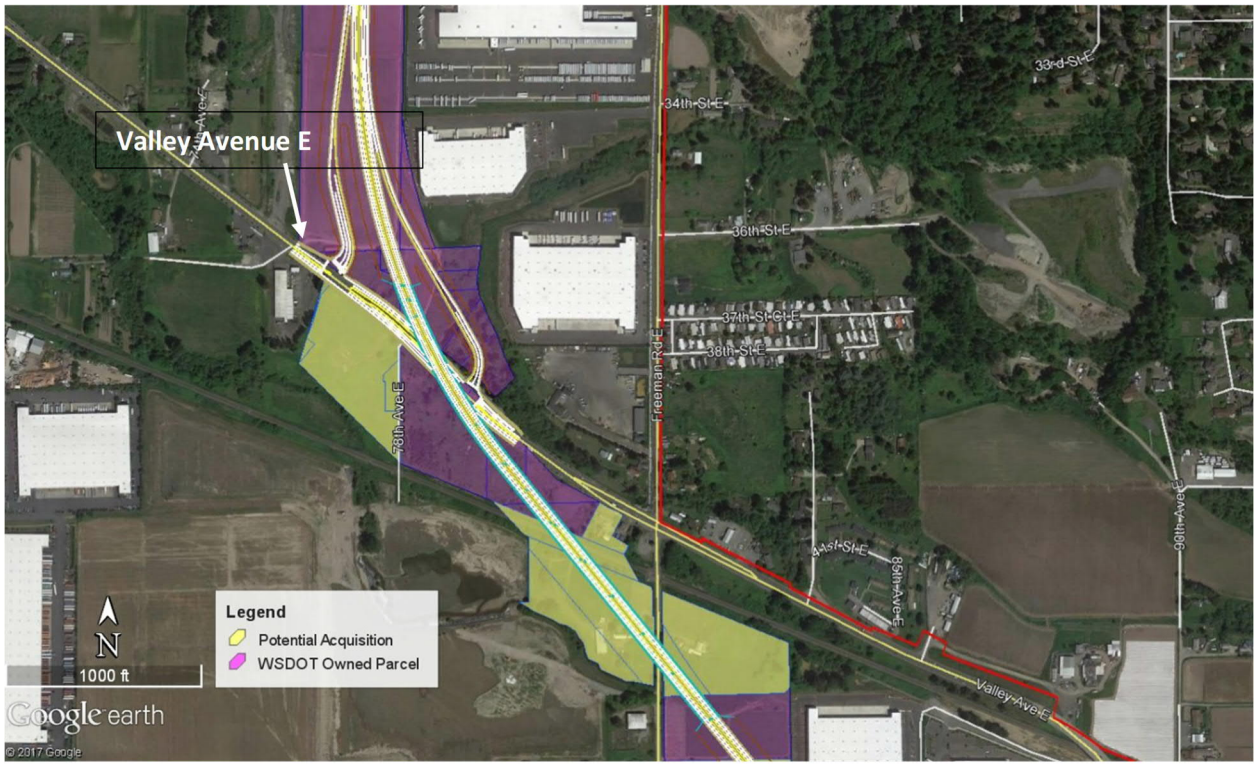


Exhibit 4.13-9, shows a large commercial property located south of Valley Avenue E. A portion of that property would be acquired for the project's future ramps to the south of Valley Avenue E. This property would be impacted by the establishment of limited access along the Valley Avenue E frontage. However, WSDOT's design would ensure enough frontage for a commercial access into the property at the western end of the parcel.

Exhibit 4.13-9. Location of Commercial Property South Valley Avenue East



Source: Google Earth 2017

Currently there is also a roadway bridge over Hylebos Creek on 8th Street E, which pedestrians use to make a loop when walking the Hylebos Creek Nature trail and the Milgard Nature trails. WSDOT's design would remove that roadway bridge and replace it with a pedestrian bridge so that the loop and walking access to the nature trails is maintained.

Enhanced Mobility for Land uses

The Phase 1 Improvements would not result in any new or substantial impacts on mobility for land uses. The completion of the new SR 167 Project's Phase 1 Improvements would provide an alternative route, and anticipated shorter travel times for all users. Although the Phase 1 Improvements would increase roadway capacity to a lesser extent than the 2006 FEIS Build Alternative, it would still result in improved reliability of people and goods movement.

The improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS. The SR 167 Phase 1 Improvements would result in decreased travel times for several routes along the corridor, and improved access to a large amount of industrially zoned land, including the Port of Tacoma.

The effects of the Phase 1 Improvements on Port activities are expected to be similar to what was presented in the 2006 FEIS. The Phase 1 Improvements would greatly improve traffic transporting goods and services to and from the Port of Tacoma.

Consistency with Land Use Plans and Policies

As part of this Re-evaluation a review of land use plans was conducted to ensure that the Phase 1 Improvements are in compliance with the established plans and policies for the affected jurisdictions. It was determined that the Phase 1 Improvements are consistent with local land use plans. Most jurisdictions in the state are required to adopt a Comprehensive Plan consistent with the Washington State Growth Management Act (GMA) governed by RCW 36.70A. Each of the Comprehensive Plans establish policies for community growth and development for a 20-year period and are updated every eight years. The proposed SR 167 Project Phase 1 Improvements are not expected to induce unplanned regional growth, but could alter the rate, timing, and location of development within the corridor area as planned by local and regional jurisdictions.

City of Tacoma

One Tacoma, the City's Comprehensive Plan, was updated in 2015 and builds on the City's 2004 plan, Tacoma 2025, and the Transportation Master Plan. The plan guides the development in Tacoma over the long term and describes how the community's vision for the future is to be achieved. The completion of SR 167 Completion Project Phase 1 Improvements is noted as a top priority in the Transportation Element of the plan. Similar to the findings of the 2006 FEIS, the SR 167 Completion project is consistent with the goals and policies of the current Comprehensive Plan.

The City of Tacoma Transportation Master Plan is contained within the Transportation Element of the City's Comprehensive Plan. SR 167 is called out in the Transportation Master Plan as "not a complete freeway between Puyallup and Tacoma. This uncompleted freeway link has been identified as a critical missing link in the State's highway network." There are no specific goals or policies in the plan that directly relate to the Phase 1 improvements; however, completion of the project would help complete the freeway system between Puyallup and Tacoma.

Port of Tacoma

Port of Tacoma Development Planning was addressed in the 2006 FEIS. Since then, the Port of Tacoma has adopted (in 2012) and updated annually, The Port of Tacoma Strategic Plan. This plan guides Port-decision making when investing in assets and builds on existing strengths to ensure long-term future success. The Land Use and Transportation Plan supports the implementation of future business growth, a key goal identified in the Strategic Plan. The SR 167 Completion Project Phase 1 Improvements is described in the plan as providing a much-improved connection to key warehousing and trans-loading centers in Fife, Sumner, and Kent.

The Regional and Port Access section of the Port of Tacoma Land Use & Transportation Plan lists the following as an action strategy for the Port:

- Provide regional leadership in securing the funds needed to complete SR 167

The completion of SR 167 Completion Project Phase 1 Improvements is described as a critical missing link in the state's highway network. For the Port of Tacoma, the completion of SR 167 would "provide a much-improved connection to key warehousing and trans-loading centers in Fife, Sumner, and Kent." WSDOT's proposed Phase 1 Improvements would fulfill the action strategy of the Port and provide them key benefits.

City of Fife

The City of Fife Comprehensive Plan (released in 1996, as amended) cited in the 2006 FEIS was updated in 2005 and maintained the 1996 Plan's vision and most of the policies established by that Plan. In 2013 the City of Fife began the process for updating the Comprehensive Plan for the required GMA update and in 2015 adopted the current plan guiding development within the city through 2035. The new plan contains several goals and policies related to the completion of SR 167 Completion Project Phase 1 Improvements.

The City of Fife Comprehensive Plan contains a number of references to the SR 167 Completion Project Phase 1 Improvements. Goal 13 in the Land Use Element of the Plan directs the City to "Where appropriate, encourage a mixture of appropriate commercial, industrial, and office park uses along the SR 167 freeway corridor in compliance with all city concurrency requirements and policies."

The purpose and need of WSDOT's SR 167 Project Phase 1 Improvements is consistent with Goal 13.

City of Puyallup

The City of Puyallup's Comprehensive Plan (released in 1994, as amended) cited in the 2006 FEIS was last updated in 2015. The Comprehensive Plan presents a broad statement of the community's vision for the future and contains policies primarily to guide the physical development of the city, as well as certain aspects of its social and economic character. The Transportation element of the updated plan contains goals and policies related to the completion of SR 167 Completion Project Phase 1 Improvements.

The Land Use Element of the City of Puyallup Comprehensive plan describes the SR 167 corridor as one of the three primary state routes for freight movement in Puyallup. SR 167 is a T-2 Freight Corridor which connects Puyallup with the Port of Tacoma to the west to a heavy industrial corridor north of Sumner. Goal T-1 (under the Transportation Goals and Policies) directs the City to "Proactively develop partnerships to best serve all users of the regional transportation system.

WSDOT's proposed SR 167 Phase 1 Improvements would benefit the City of Puyallup as well as the region and would therefore be consistent with Goal T-1 and the policy identified above.

City of Milton

The City of Milton Comprehensive Plan (released in 1996, as amended) cited in the 2006 FEIS was more recently updated in 2015. The City began the process of updating the Comprehensive Plan, which serves as the City's road-map for future change and growth, towards the end of 2011. The SR 167 Completion Project Phase 1 Improvements is briefly noted in the plan. While the completion of SR 167 Completion Project Phase 1 Improvements is only included as a planned regional project in the City of Milton Comprehensive Plan, the proposed Phase 1 Improvements would help support the goals and policies from the Transportation Element of City's Comprehensive Plan.

City of Edgewood

Since the 2006 FEIS, the City of Edgewood's Comprehensive Plan was updated and adopted in 2015 and looks forward to 2035, providing a vision for the future, identifying goals and policies to achieve that vision, and creating a basis for the City's regulations and guide for future decision making. The Transportation element of the updated plan contains goals and policies related to the SR 167 Completion Project Phase 1 Improvements.

The SR 167 Phase 1 improvements would improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement. This would help support the related goal and policy of the Comprehensive Plan.

Consistency with Regional Plans and Policies

The Phase 1 Improvements would be consistent with regional plans and policies. VISION 2040, adopted in 2008, serves as the PSRC's integrated long-range growth management strategy. The plan focuses on sustainability in the incorporation of a projected additional 1.7 million people in the Puget Sound Region by 2040. It promotes the development of a coordinated transportation system that is integrated with and supported by the growth management strategy and builds upon and supports local, countywide, regional, and state planning efforts. Countywide planning policies in each of the counties supply the local framework and provide additional detail for county and city comprehensive plans.

VISION 2040's focus is to contain growth, concentrate new employment in urban centers, and link the centers with a high-quality multimodal transportation system. The PSRC has designated downtown Tacoma as a regional growth center and the Port of Tacoma as a manufacturing/industrial center. WSDOT's proposed SR 167 Phase 1 Improvements would provide essential transportation infrastructure and help support the regional growth center and Manufacturing/industrial center designations of downtown Tacoma and the Port of Tacoma.

The Destination 2030 Metropolitan Transportation Plan referred to in the 2006 FEIS has been updated since the FEIS was released. The most current version of the PSRC regional plan, Transportation 2040: towards a sustainable transportation system (Transportation 2040), was adopted in 2010 (PSRC, 2010) and updated in 2015 (PSRC, 2015). The new plan is the transportation element of Vision 2040, the growth management, environmental, economic, and transportation strategy for the Central Puget Sound region.

One of the issues addressed in Transportation 2040 that specifically identifies SR167 is related to addressing regional congestion and mobility. Transportation 2040 states that completing "key roadway projects that would enhance freight mobility, such as…SR 167 extension…" would be important for the region. This acknowledgement is similar to, but more specific than, what was included in the Destination 2030 Metropolitan Transportation Plan that was described in the 2006 FEIS. The proposed Phase 1 Improvements would help meet the regional objectives described in Transportation 2040 in

ways that would be similar to, or the same as, those described in the 2006 FEIS for Destination 2030 Metropolitan Transportation Plan.

Effects during Construction

Property Acquisitions

The Phase 1 Improvements would not result in any new or substantial property acquisition impacts. The Phase 1 Improvements would result in an estimated 516 acres of property acquisition as compared to between 500 and 543 acres estimated in the 2006 FEIS. As was the case in the 2006 FEIS, a number of commercial and agricultural properties would be acquired for ROW purposes under the SR 167 Project's Phase 1 Improvements. ROW acquisitions would affect properties within the cities of Tacoma, Fife, Milton and Puyallup as well as a few pockets of unincorporated Pierce County. Some ROW acquisition within Edgewood north of Valley Avenue E may be necessary, depending upon the SR 167 Completion Project Phase 1 Improvements' ultimate need for compensatory wetland mitigation. The 2006 FEIS estimated that a total of 286 to 306 acres would be needed for roadway ROW and an additional 214 to 237 acres would be needed for the RRP. As shown in Exhibit 4.13-10, these estimates remain consistent for what is needed for the Phase 1 Improvements. Since the ROD was issued in 2006, WSDOT has proceeded to acquire approximately 70 percent of the property identified for the Phase 1 alignment (Exhibit 4.13-6). Those properties that are now owned by WSDOT are for the most part vacant or are being leased on a year-to-year tenancy basis for farming purposes. Exhibit 4.13-10 summarizes the breakdown as disclosed in the 2006 FEIS and compares it to current conditions.

Exhibit 4.13-10. Property Acquisition Comparison

	Residential (acres)	Commercial/ Industrial (acres)	Agricultural (acres)	Vacant (acres)	General/Public (acres)	Total (acres)
2006 FEIS						
2006 FEIS (ROW)[a]	42–48	40–43	91–112	95–105	9–11	286–306
2006 FEIS (Riparian Restoration)	48–59	25–26	59–71	51	31	214–237
2006 FEIS Totals	90–107	65–69	150–183	146–156	40–42	500–543
Phase 1 Improvements						
Property Acquired since 2006 (ROW)[b]	27	17	173	36	0	253
Future Property Acquisitions (ROW)	13	36	47	21	5	122
ROW Totals	40	53	220	57	5	375
Property Acquired since 2006 (Riparian Restoration)[b]	16	3	41	47	0	107
Future Property Acquisitions (Riparian Restoration)	3	6	13	6	6	34
Riparian Restoration Totals	19	9	54	53	6	141
Phase 1 Improvements Totals	59	62	274	110	11	516

[a] It was noted in the 2006 FEIS that the final acreage purchased by WSDOT for ROW would be higher because the remainder of some parcels would be rendered unusable. The decision to purchase the remainder of a parcel would be made on a case-by-case basis and could not be determined at that time. Page 3-288 of the 2006 SR 167-Puyallup to SR 509 Tier II FEIS.

[b] Data as of January 2018.

Commercial Relocations

The Phase 1 Improvements would not result in any new or substantial commercial relocations. The Phase 1 Improvements would result in an estimated 19 commercial relocations as compared to 28 estimated in the 2006 FEIS. The Phase 1 Improvements would result in the acquisition of fewer commercial properties and the relocation of fewer businesses than estimated for the 2006 FEIS Build Alternative. An estimated 19 businesses and their employees would be displaced as part of the Phase 1 Improvements, 5 have already been acquired with 14 remaining to be acquired. These displacements would not affect the regional economy given that the businesses are service oriented, and because the types of businesses are common in the project area, similar commercial space (as well as employment opportunities) exist nearby. Retail and industrial (warehouse) space would be the two types of commercial space needed for relocation.

Puyallup Tribal Trust Lands

The Phase 1 Improvements would not result in any new or substantial impacts on Puyallup Tribal Trust Lands. The Phase 1 Improvements would affect six tribal parcels as compared to twelve identified in the 2006 FEIS. The six Puyallup Tribe of Indians' parcels are currently located within or adjacent to the proposed project ROW and would require either access rights or fee acquisition. All of the six Tribal

parcels are identified through the Pierce County Assessors online database as being in Tribal Trust. Exhibit 4.13-6 shows the Tribal parcels, but some of the parcels are adjacent to each other and show up as a solid block. Of the six parcels, one falls within the proposed SR 509 Spur mainline while the other parcels are abutting to the proposed mainline and would require securing access rights.

After issuance of the Tier I ROD in June 1999, the PTOI purchased two parcels in the vicinity of 12th Street E that would be impacted by the alignment. In October 2007 the PTOI purchased the Dekeyser Farm (approximately 100 acres), which is now designated as Trust Land. As a result, the alignment of the Phase 1 Improvements was shifted to the north to avoid direct property impacts and would only impact access from Valley Avenue that includes an at-grade crossing of the UPRR. Access to these parcels would remain through their existing access off Freeman Road.

Property Tax Revenue

The Phase 1 Improvements would not result in any new or substantial impacts on property tax revenue. The Phase 1 Improvements would acquire a similar amount of property, with a similar amount of property tax loss as identified in the 2006 FEIS. As discussed in the 2006 FEIS, there would be short-term impacts on the tax base due to ROW acquisitions and the potential loss of retail sales tax revenue if displaced businesses relocate to another jurisdiction. However, it is anticipated that the vast majority of lost revenue would be recovered as vacant land is developed or as the remaining land from displaced users is redeveloped.

The project corridor is predominantly zoned for industrial/commercial and property values are not expected to decline over the long-term as result of the roadway improvements. Residential property values within the study area are equitable and stable compared to local markets. Due to the fact that the new corridor is located on properties zoned for commercial and industrial use, the roadway is unlikely to impact the market negatively.

The proposed Phase 1 Improvements close proximity to the Port of Tacoma and Port of Seattle, which together form the fourth-largest gateway in the United State for container cargo, make the area appealing to port related warehouses and manufactures. Commercial properties within the project corridor are valued from $1.36 to $46 per square foot for vacant commercial land in during the time period of 2015-2018. Improved commercial properties within the project corridor characteristically bring between $85,000 to more than $6,800,000 per site. Properties closest to the I-5 corridor typically demand the highest value.

The effect on property tax revenue would be offset by the improved traffic flow and increase in accessibility for properties within the overall travelshed. As a result, the cities would likely experience indirect increase in tax revenues to the extent that businesses grow or relocate and new businesses are created.

Sales Tax Revenue

The Phase 1 Improvements would not result in any new or substantial impacts on sales tax revenue. The Phase 1 Improvements would relocate fewer businesses than were estimated in the 2006 FEIS. Four businesses located along I-5 and SR 99 would be displaced within the City of Milton and nine businesses would be displaced within the City of Fife. The loss of these businesses would result in a decrease to the City's sale tax revenue if displaced businesses relocate to another jurisdiction. Exhibit 4.13-11 indicates that displaced businesses are within the retail trade, wholesale trade, manufacturing and FIRES and Services sectors.

Exhibit 4.13-11. Businesses by Industry Sector

Description	City of Fife Affected Businesses	City of Milton Affected Business
Education	-	-
Government	-	-
Retail Trade	1	3
Wholesale Trade	1	-
Manufacturing	4	1
FIRES and Services	3	-
Construction and Resources	1	-

Sales tax revenue contributes to 32 percent of the City of Fife's general fund and 21 percent of the City of Milton's general fund (Exhibit 4.13-12). According to the Washington State Department of Revenue there are over 1,800 individuals or companies licensed to do business in the City of Fife and approximately 850 individuals or companies licensed to do business in the City of Milton. Exhibit 4.13-12 indicates that the largest amount of taxable retail sales within both jurisdictions come from the retail trade industry sector.

Exhibit 4.13-12. Taxable Retail Sales by Industry Sector

Sector	City of Fife	City of Milton
Education	$253,661	$43,340
Government	$18,733	$0
Retail Trade	$643,395,617	$51,261,593
Wholesale Trade	$85,819,755	$6,544.788
Manufacturing	$5,432,779	$2,036,062
FIRES	$35,447,064	$2,135,875
Service Sector	$106,114,683	$29,931,609
Construction and Resources	$71,596,540	$8,759,732

Source: Washington State Department of Revenue (2018)

Because the amount of retail sales tax generated by the displaced businesses is not publicly available it is difficult to quantify the actual effect. However, it is estimated that the vast majority of lost revenue would be recovered assuming businesses would relocate within the local area, particularly along the I-5 corridor (Fife and Milton). As was indicated for the property tax revenue, it is anticipated that the loss in sales tax revenue would be short-term and that the economic revenue would be recovered as the remaining vacant property is developed or as the remaining land from displaced users is redeveloped. The City of Fife's close proximity to the Port of Tacoma, the fourth largest gateway for containerized cargo in the United States when combined with the Port of Seattle, makes it appealing to port-related warehouses and manufactures. As such, the businesses immediately adjacent to the proposed SR 167 Project alignment are expected to experience economic benefits due to the new freeway availability as well as to the proximity of the port. Displacements, disruptions, and relocations are discussed more fully in Appendix N, the Displacement, Disruption, and Relocation Technical Memorandum.

Construction-Related Employment

The Phase 1 Improvements would not result in any new or substantial impacts as a result of construction-related employment. As was indicated in the 2006 FEIS, the Phase 1 construction is expected to result in both long- and short-term employment impacts in Pierce County.

The overall effect of construction and job reallocation in the project area would have a positive impact on the local economy as well. The project would create temporary induced employment for Pierce County and adjoining county residents, and benefit local/regional economies as these earnings are expended for goods and services.

Permanent employment impacts would be minimized through the relocation process. Although displacement of some businesses is anticipated, no employment loss is estimated. In some cases, commercial enterprises operate from more than one location. Displacement may require some of the employees working within the project impact area to be reassigned to neighboring work sites.

Some businesses located within the project area along the I-5/SR 99 corridor depend upon their proximity to the I-5 corridor and high visibility for product display. ROW impacts may create a loss of commercial frontage space resulting in a decrease of parking and display/showroom space.

With construction of the Phase 1 Improvements, agricultural employment is anticipated to decline due to permanent loss of land currently in agricultural use. While these operations employ anywhere from two to ten farmhands, the vast majority of the work is seasonal, and the farmhands are not employed year-round. It is typical for seasonal farmhands to migrate from one agricultural region to the next depending upon regional weather conditions and the timing of sowing and harvesting crops.

Temporary Travel Disruptions

The Phase 1 Improvements would not result in any new or substantial disruption to travel. As was indicated in the 2006 FEIS, access to businesses and residences throughout the study area would remain open or a detour would be provided during the construction period. The majority of the Phase 1 Improvements would be constructed utilizing alternating lane and shoulder closures to establish required work zones. The duration of these lane and shoulder closures are anticipated to range between two weeks and nine months with some of the lane and shoulder closures occurring at night to minimize disruption to daily traffic operations. It is also anticipated that weekend closures of intersections would be required in order to construct the necessary improvements. It is also anticipated that weekend closures of arterial and highway segments would be required in order to construct superstructure over the roadway. Detours would be utilized as needed to minimize disruption to traffic operations.

Travel along segments of the project corridor could be slowed due to construction traffic delivering materials, which may cause some businesses to notice a downturn in their customer base. The vast majority of temporary construction impacts would occur along the I-5 Corridor. Businesses in this section of the project area have primary access located along 54th Avenue E and SR 99. While access to these businesses would not be directly impacted by construction, added congestion from construction traffic in the area may inconvenience customers with longer wait times due to increased volumes.

In the northern project area near I-5, businesses are predominantly industrial or warehouse type businesses providing service outside of their base of operations. While access to facilitate the transportation of goods and services is important for industrial and warehouse type businesses, they are less likely to be economically impacted during construction than convenience type businesses such as restaurants, gas stations, and mini-marts. Businesses that rely on convenient customer access could experience an economic downturn as customers may choose to avoid construction delays and

congestion by patronizing similar businesses outside of the construction zone. Once construction activities have been completed, it is expected that business patterns would return to previous levels.

Mitigation

Mitigation measures during operations would be the same as described in the 2006 FEIS. WSDOT would continue to coordinate with local jurisdictions and regional authorities to integrate Phase 1 Improvements with other transit-related projects and to minimize unavoidable adverse effects on land uses from the combination of the projects. Long-term impacts on tax revenues are expected to be positive and not require mitigation. In the short-term, any reductions in tax base and stagnation could be mitigated through advance purchase of ROW and effective construction phasing and scheduling.

Mitigation measures during construction are the same as described in the 2006 FEIS. WSDOT would use standard construction mitigation measures for dust, traffic management and visual impacts. In addition, WSDOT would minimize traffic delays by phasing and scheduling construction activities outside of high traffic demand periods as much as possible. The scheduling of road closures and detour routes will be coordinated with police, fire and emergency services, school districts, and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will conform to state and local regulations. Restricting lane closures and construction that impact traffic during peak commuter-hours and peak holiday travel periods should help to ease backups and time delays. Maintaining ongoing communication will keep local residents informed of development phases, areas of construction and possible travel alternatives.

The Phase 1 Improvements are consistent with local comprehensive plans, zoning ordinances, and other applicable regulations in effect at the time of review.

Conclusion

With adherence to the mitigation measures described above, no new significant impacts on land use and socioeconomics from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures would be required. See also Attachment M, Land Use and Socioeconomics Technical Memorandum.

4.14 Displacement, Disruption, and Relocation

Affected Environment

Since publication of the FEIS in November 2006, WSDOT has continued to acquire property for the ROW and has relocated predominantly residences, but also a couple of businesses that were identified as displacements in the 2006 FEIS. The affected environment relative to displacement, disruption, and relocation described in Section 3.13 of the 2006 FEIS remains applicable to the proposed Phase 1 Improvements. The project area includes land currently in industrial, commercial, vacant/undeveloped, residential, and agricultural use.

The analysis conducted for this Re-evaluation summarizes changes based on the assessed property acquisition needs through January 15, 2018. Additional property acquisition for the Phase 1 Improvements would convert existing land uses to transportation-related uses for the highway alignment, and project features such as stormwater facilities, riparian restoration, the relocation of Hylebos Creek, wetland mitigation, etc. The exhibits below summarize the numbers of residential units, businesses, public, and farm (agricultural use) property displacements from the 2006 FEIS compared to displacements necessary for the Phase 1 Improvements, including any potential acquisitions as of January 15, 2018. Vacant land acquisitions are not included in the exhibits. Exhibit 4.14-1 lists how many properties have been purchased by WSDOT since 2006 (through January 15, 2018), and how many acquisitions remain.

Exhibit 4.14-1. Comparison of Displacements - 2006 FEIS Build Alternative vs. Phase 1 Improvements

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm	Totals
2006 FEIS						
Highway Alignment	65[a]	21	27[a]	1	1	115[a]
Wetland Mitigation and RRP	26	8	3	3	1	41
Total	91[a]	29	30[a]	4	2	156[a]
Phase 1 Improvements						
Highway Alignment	74	9	19	5	5	112
Wetland Mitigation and RRP	18	8	0	3	0	29
Total	92	17	19	8	5	141
Acquired (as of 1/15/2018)	64	0	5	2	4	75
Remaining to be acquired	28	17	14	6	1	66

Source: 2006 FEIS Table 3.13-1 and Table 3.13-2, and summary of Phase 1 improvement impacts as described below.

[a] Includes additional units not included in the 2006 FEIS due to an oversight as described below.

As provided in Exhibit 4.14-1, there would be fewer displacements caused by the Phase 1 Improvements than for the 2006 FEIS Build Alternative. The slight increase shown for displacements of both "Public" and "Farm" use is most likely due to the criteria used to define each parcel in 2006, compared to the criteria used in 2018, which was based on the current use. The exhibit also shows an increase in displacements for "Single Family Units." However, there is a decrease in displacements for "Manufactured Home and Multi-family Units," and "Business," as well as a decrease in the total number

of displacements, which are 141 total under the Phase 1 Improvements, compared to 156 displacements for the 2006 Build Alternative.

Effects during Operation

The properties that would need to be acquired for the Phase 1 Improvements are different in some areas compared to acquisitions identified for the 2006 FEIS Build Alternative. This is due to design adjustments of the alignment within the corridor, and the smaller footprint of the Phase 1 Improvements. The following paragraphs describe the impacts on displacements of the Phase 1 Improvements in more detail, and are listed by area in the same sequence as the 2006 FEIS Chapter 3.13.

54th Avenue Interchange Area (from SR 509 to 12th Street)

At the 54th Avenue E interchange, the loop ramp has been replaced with a ½ single point urban interchange to the east of 54th Avenue. In addition, the alignment at this location has been shifted to the north and consequently there are eleven new impacted properties on the west side of 54th Avenue, consisting of nine businesses, one residence, and two vacant parcels. The nine businesses include Marvin Sheet Metal, two machine shops, Auto-Chlor System, Matheson Gas, the M&A Investments' storage shop, Baydo's RV Service Center, Downing Collision repair, and Canteen Vending Services. The City of Fife owns a vacant residence in this area, and one property owner has a residence on one parcel and his other parcel is vacant industrial land for sale. One additional single-family residential property has already been acquired by WSDOT. On the east side of 54th Avenue, another property owner includes a residence and operates Auto Repair Fife. In addition, there is one residence east of 54th Avenue which may be displaced. Three additional single-family residential properties have already been acquired by WSDOT. The four residential properties acquired by WSDOT were previously identified as part of the 2006 FEIS analysis, however due to an oversight, they were not included in the 2006 FEIS text or in Table 3.13-2.

All seven of the commercial businesses on the west side of 54th Avenue identified in the 2006 FEIS are no longer displaced. An 8th business (Carson Home) on the east side of 54th Avenue may only require a minor access revision compared to a total parcel acquisition described in the FEIS. In addition, the three large OPUS warehouse buildings north of 8th Street would no longer be disrupted under the Phase 1 Improvements.

Right of way would be required for the construction of travel lanes. Nine manufactured home units located in the Hylebos Creek Estates that were identified as impacted in the 2006 FEIS and would continue to be impacted by the Phase 1 improvements and remain to be acquired.

Nine residential single-family homes were identified in the 2006 FEIS to be displaced in the vicinity of 8th Street to 12th Street Six of the nine have already been acquired and the three remaining properties are in the process of being acquired. Ten additional single-family residential properties not identified in the 2006 FEIS would also be displaced, eight have already been acquired by WSDOT, another two are in the process of being acquired.

In summary, nine commercial businesses identified in the 2006 FEIS as being displaced are no longer displaced. In place of those nine, eight new commercial businesses may be displaced. Eighteen single-family residences have already been purchased by WSDOT. Eight single family residences and nine manufactured home units are yet to be acquired. In total, when accounting for the oversight, there would be an additional 13 single family units and two businesses displaced compared to what was identified in the 2006 FEIS analysis in this area. One less public property would be displaced.

Exhibit 4.14-2. Comparison of Displacements for 54th Avenue Interchange Area (from SR 509 to 12th Street) - 2006 FEIS Build Alternative vs. Phase 1 Improvements

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS[a]	13[a]	9	8	1	0
Phase 1 Improvements	26	9	10	0	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts as described in Section 3.3
[a] Includes four additional single family units not included in the 2006 FEIS due to an oversight.

I-5 Interchange Area (from 12th Street to 20th Street)

The full system level interchange including direct-connect HOV ramps described in the 2006 FEIS has been replaced with a service level signal-controlled Diverging Diamond Interchange (DDI). The DDI results in a smaller footprint through the I-5 corridor and allows for a refined 70th Avenue relocation design. As a result, the twelve multi-family residence units in the Mountain View Apartment complex identified in the FEIS would no longer be impacted under the Phase 1 Improvements.

Fourteen commercial business displacements were identified in the 2006 FEIS. Eight of these commercial businesses impacted by the 2006 FEIS Build Alternative are no longer impacted by the Phase 1 Improvements. The eight commercial properties no longer impacted include Java Junkie, Quality Home Enclosures, Heartland Express, Urban Paintball Park, Linwood homes, a Puyallup Tribe of Indians' Tribal Trust property, Acura of Fife, and Selden Furniture. The six commercial properties impacted by the 2006 FEIS and still impacted by the Phase 1 Improvements include King County Auto Auction, the Golden Rule Motel, Freeway Trailer Sales, Blue Dog RV, Kanopy Kingdom and General Trailer Parts.

The Phase 1 Improvements would impact nine businesses. As of January 15, 2018, WSDOT has acquired properties which include five of the nine businesses impacted, consisting of Shurgard Mini Storage, Olympic Boat Center, Western Superior Structurals Manufacturing, King County Auto Auction and the Golden Rule Motel. The remaining four businesses to be acquired include Freeway Trailer Sales, Blue Dog RV, Kanopy Kingdom and General Trailer Parts.

Seven residential properties north of I-5 have been acquired for the Phase 1 Improvements, whereas the 2006 FEIS identified 4 residential parcels to be acquired.

On the south side of I-5, only one of six residential parcels impacted by the 2006 FEIS roundabout design on 20th Street has been acquired, while the other five are no longer impacted by the Phase 1 Improvements.

The 2006 FEIS identified twenty-one residential properties along 70th Avenue to be acquired. All twenty-one residential properties along 70th Avenue have been acquired.

In summary, a total of two single family units, twelve multi-family units and five businesses identified in the 2006 FEIS would not be displaced as compared to the Phase 1 Improvements. A total of twenty-nine residences, nine businesses, and five public facilities may be displaced with the Phase 1 Improvements around the I-5 interchange area.

Exhibit 4.14-3. Phase 1 Improvement Displacements for I-5 Interchange Area (from 12th Street to 20th Street)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	31	12	14	0	0
Phase 1 Improvements	29	0	9	5	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts.

Valley Avenue Interchange Area (from 20th Street to Freeman Road)

Near Valley Avenue, the 2006 FEIS identified displacements of six family units, two businesses and one agricultural property. The Phase 1 Improvements reduce displacement impacts as compared to the 2006 FEIS due to the replacement of the loop off-ramp with a half-diamond interchange to the north of Valley Avenue. Due to this change, one commercial business (Washington Lettuce), three residential parcels, three vacant industrial properties, and one agricultural property are no longer impacted under the Phase 1 Improvements. The smaller footprint also eliminates impacts on an existing tribal business and a newly acquired tribal property as compared to the FEIS. Two residences have been purchased and one residence remains to be purchased near the Valley Avenue interchange.

Under the 2006 FEIS and Phase 1 Improvements five residential displacements have been identified along the SR 167 mainline alignment from south of 20th Street to west of Freeman Road. Four residences have been acquired by WSDOT, and one residence may be displaced. Under the Phase 1 Improvements, five new farm impacts have been identified. Four of these new farms have been acquired by WSDOT, and one new farm remains to be purchased.

In summary, a total of three single family units, and two businesses identified in the 2006 FEIS would not be displaced as compared to the Phase 1 Improvements. There would be a total of four additional farms displaced due to the Phase 1 Improvements as compared to the 2006 FEIS.

Exhibit 4.14-4. Phase 1 Improvement Displacements for Valley Avenue Interchange Area (from 20th Street to Freeman Road)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	11	0	2	0	1
Phase 1 Improvements	8	0	0	0	5

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts.

SR 161/SR 167 Interchange Area (from Freeman Road to SR 512)

The North Levee Rd to Valley Road connection known as VALE described in the 2006 FEIS is not part of the Phase 1 Improvements. The proposed project maintains the full SPUI at N. Meridian Road, but does not include any widening of the Puyallup River Bridge. Six residences adjacent to the northbound SR 167 to southbound SR 512 on-ramp identified under the 2006 FEIS may still be displaced by the Phase 1 improvements. Five additional residences between Freeman Avenue and N. Meridian Rd are now anticipated to be displaced under the Phase 1 Improvements. One commercial business identified under the 2006 FEIS is no longer anticipated to be impacted, and three previously vacant industrial parcels have since been developed and are not anticipated to be impacted.

In summary, there would be a total of five additional single family units, and one less business impacted by the Phase 1 Improvements as compared to the 2006 FEIS in the SR 161/SR 167 interchange area.

Exhibit 4.14-5. Phase 1 Improvements Displacements for SR 161/SR 167 Interchange Area (from Freeman Road to SR 512)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	6	0	1	0	0
Phase 1 Improvements	11	0	0	0	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts.

RRP - Mainline SR 509 to I-5 Segment

Seven single family units and eight multi-family residential units were identified in the 2006 FEIS as being displaced. Thirteen single family and eight manufactured homes now need to be acquired along Hylebos Creek as part of the Phase 1 improvements. Of those thirteen single family units, eleven have already been acquired by WSDOT. The two remaining single-family units no longer include residences, one has been acquired, and one remains to be acquired. The City of Fife water control station is still anticipated to have some impacts under the Phase 1 Improvements but is not expected to be displaced.

The eight manufactured homes within the RRP for the SR 509 to I-5 segment together with the manufactured homes identified within the roadway ROW near the 54th Avenue E interchange (discussed in the 54th Avenue interchange area above) would displace the entire Hylebos Creek Estates complex. All of the manufactured homes of the Hylebos Creek Estates complex remains to be acquired.

The one business identified in the 2006 discipline report would not be displaced.

Exhibit 4.14-6. Phase 1 Improvements Displacements for Mainline SR 509 to I-5 Segment

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	7	8	1	2	0
Phase 1 Improvements	11	8	0	0	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts.

RRP - Mainline I-5 Interchange Segment

The 2006 FEIS stated there would be nine residential displacements associated with the RRP, however due to an oversight, Table 3.13-2 only listed five. The FEIS also states there would be three businesses displaced due to the RRP, however due to an oversight, the table only lists one. Under the Phase 1 Improvements, there are no longer any businesses that may be displaced due to the RRP around the I-5 interchange area, instead two residences would be acquired. Three new public facilities and one vacant residential parcel impacted by the Phase 1 Improvements remains to be acquired.

Exhibit 4.14-7. Phase 1 Improvements Displacements for Mainline I-5 Interchange Segment

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS[a]	9	0	3	0	0
Phase 1 Improvements	2	0	0	3	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts.

[a] Includes four additional single family units and two businesses not included in the 2006 FEIS due to an oversight.

RRP – Mainline I-5 to Valley Avenue Segment and Valley Avenue Interchange

On the segment between I-5 and Valley Avenue, the 2006 FEIS stated that 3 single family units, 1 public facility and 1 farm property would be acquired. At the Valley Avenue interchange, the 2006 FEIS stated that there would be eleven single family residential units and one commercial business to be displaced. One of the residences impacted by the Valley Avenue interchange has been acquired and one more is yet to be acquired, however, impacts from the Phase 1 Improvements is due to the mainline footprint, not the RRP. The other sites are not anticipated to be impacted by the RRP. In addition, the Firwood Tavern burned down (date unknown) prior to WSDOT acquiring this parcel. In summary, none of the sites identified in the 2006 FEIS and no new additional sites are anticipated to be impacted by the Phase 1 Improvements RRP work.

Exhibit 4.14-8. Phase 1 Improvements Displacements for Mainline I-5 to Valley Avenue Segment and Valley Avenue Interchange

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS – I-5 to Valley Avenue	3	0	0	1	1
2006 FEIS – Valley Avenue interchange	11	0	1	0	0
Phase 1 Improvements	0	0	0	0	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts.

Wetland Mitigation

No wetland mitigation sites were identified in the 2006 FEIS. Based on the current list of potential wetland mitigation sites, WSDOT anticipates five single family residences would need to be displaced. WSDOT's design effort is still progressing regarding development of the wetland mitigation plan, which may necessitate additional property acquisition beyond the current list of sites.

Exhibit 4.14-9. Phase 1 Improvements Displacements for Wetland Mitigation

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	0	0	0	0	0
Phase 1 Improvements	5	0	0	0	0

Public Properties

Exhibit 4.14-1 indicates eight Public properties would require displacement for the Phase 1 Improvements as compared to four in the 2006 FEIS. These generally include vacant land with no improvements, asphalt parking, or parcels with public works equipment/storage sheds.

One public property includes a portion of the City of Milton's Interurban Trail, which WSDOT intends to relocate, but would maintain connectivity and continued public use, pursuant to U.S. Department of Transportation Section 4(f) requirements. This property acquisition (and required mitigation) is consistent with the 2006 FEIS for the Build Alternative. Additional detail on this property is included in the separate Section 4(f) Evaluation.

Farm Properties

Exhibit 4.14-1 indicates five Farm properties would require displacement for the Phase 1 Improvements as compared to 2 in the 2006 FEIS. Since publication of the 2006 FEIS, most of the parcels currently being used for agriculture are owned by WSDOT and are being leased. A few farms can also be found as an interim use on properties that have been zoned for residential, commercial, or industrial use. This is consistent with the 2006 FEIS. There is currently no "Farmland" as defined by the Federal Farmland Protection Act in the Phase 1 Improvements area, or lands zoned for agricultural use. More details are available in Attachment O, Farmland Technical Memorandum.

Summary of Impacts

In summary, the impacts described above are generally consistent with the impacts described for the Build Alternative in the 2006 FEIS. The changes resulting from the new proposed Phase 1 Improvements are minor, and do not result in substantial new impacts from those described in the 2006 FEIS.

As provided in Exhibit 4.14-1 above, there would be fewer displacements caused by the Phase 1 Improvements than for the 2006 FEIS Build Alternative. The Phase 1 Improvements requires additional acquisition of residential properties, public and farm compared to the 2006 FEIS, but reduced the number of manufactured/multi-family units and business acquisitions. The slight increase shown for displacements of both Public and Farm use is most likely due to the criteria used to define each parcel in 2006, compared to the criteria used in 2018, which was based on the current use. The exhibit also shows an increase in displacements for Single Family Units. However, there is a decrease in displacements for Manufactured Home and Multi-family Units, and Business, as well as a decrease in the total number of displacements, which are 141 total under the Phase 1 Improvements, compared to 156 displacements for the 2006 Build Alternative.

Effects during Construction

Consistent with the 2006 FEIS, construction activities for the proposed Phase 1 Improvements may result in temporary disturbance or disruption of access, parking, landscaping, etc., that does not result in displacement of the associated property.

Regarding displacement, typically after WSDOT acquires a property and relocates the owner or tenants, we would secure and monitor the property until the structures and improvements can be demolished. The sooner demolition can take place the better because vacant properties can attract transients and homeless encampments, which may become an additional problem area for local law enforcement. This has become a more pressing problem in the years along the proposed SR 167 Phase 1 alignment since issuance of the 2006 FEIS. There are a few properties that include designated historic structures, which cannot be demolished immediately and have in recent experience been subject to vandalism. In most cases, it is WSDOT's goal to have demolition occur within one month from the date of property evacuation. Other than the issue of vandalism of vacated property, there are no temporary construction

effects related to the acquisition and relocation of property owners that would result from the Phase 1 Improvements not already described in the 2006 FEIS.

Mitigation

Consistent with the 2006 FEIS, all of the displacements and ROW acquisition impacts for the Phase 1 Improvements are considered construction impacts, i.e., they do not result in operational impacts. Specific mitigation measures for operations phase were not proposed in the 2006 FEIS or ROD, and none are proposed for operations phase under the Phase 1 Improvements. Some future displacements or disruptions may be avoided as design progresses and additional potential mitigation measures are evaluated, including the use of retaining walls and other modifications to reduce ROW requirements. These will be determined during final design.

Consistent with the 2006 FEIS, the Real Estate Services (RES) Office of WSDOT conducts all displacement negotiations as part of the acquisition process. WSDOT will conduct negotiations with each property owner affected. The terms of the acquisition may include relocation assistance if the property owner is eligible. During the relocation negotiations, all reasonable options for minimizing the extent of the displacement are examined. Where ROW acquisition is needed, the acquisition and relocation program is conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended. Relocation resources are available to all residents and businesses without discrimination.

Mitigation measures that would be implemented to minimize construction impacts on residences, businesses, farms, and public facilities include maintaining access to existing uses wherever possible. WSDOT's construction contractor will be required to submit required construction plans to WSDOT prior to the start of any field activities. Affected businesses, residences, and other property owners would be notified of construction activities in advance, including any necessary closures or detours, and reasonable efforts would be implemented to minimize traffic disruptions and temporary access revisions during construction. These mitigation measures are consistent with the 2006 FEIS.

Similar to the 2006 FEIS build alternative, the proposed Phase 1 Improvements will be constructed in stages, which focuses the construction work areas and should minimize disturbance to residences and businesses.

Most of the minimization and mitigation measures undertaken for the Phase 1 Improvements will be associated with efforts to minimize disruption to existing businesses during construction of the new freeway and related project features. The contractor will be required to maintain access to all businesses during normal business hours and will also be required to coordinate with said businesses to ensure there is a sharing of information regarding upcoming closures or detours. Similarly, the contractor is also required to coordinate with residences that will be impacted by the access to and from their homes. The above is consistent with mitigation measures described in the 2006 FEIS.

Conclusion

No new significant impacts related to the displacement, disruption, and relocation of property owners would occur because of the proposed Phase 1 Improvements that were not previously identified for the Build Alternative in the 2006 FEIS. While no new or revised mitigation measures would be required, mitigation measures described in the 2006 FEIS and ROD commitments would be implemented during design and construction of the Phase 1 Improvements. See also Attachment N, Displacement, Disruption, and Relocation Technical Memorandum.

4.15 Farmland

Affected Environment

At the time of the 2006 FEIS, a large portion of the SR 167 Completion Project Phase 1 Improvements area was actively being farmed. Those actively farmed lands that were not committed to urban development qualified as "prime farmland" under the Farmland Protection Policy Act (FPPA). Figure 3.12-1 in the FEIS identifies the farmlands at that time.

Pursuant to the FPPA, prime farmland as defined by 7 CFR 658.2 is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

As part of the original discipline report (WSDOT, 2004) prepared to support the 2006 FEIS, a Farmland Conversion Impact Rating form was completed and submitted to the Natural Resources Conservation Service (NRCS). The NRCS administers the FPPA and uses a Land Evaluation and Site Assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. The rating score is used by NRCS as an indicator for project proponents to consider alternative sites if the potential adverse impacts on farmlands exceed the recommended allowable level. However, the eventual final score provided in the 2006 FEIS was below the threshold which would have required further consideration of impacts.

According to the NRCS, land <u>not</u> considered "farmland" under the FPPA includes:

- Land already "developed" or already irreversibly converted, using:
    - US Census urban areas maps;
    - Existing project "footprint" including right-of-way; or
- Land already committed to urban development; or
- Land committed to water storage

The above definition is still current and applicable for this Re-evaluation of the proposed Phase 1 Improvements. Based on the definition, none of the land within the SR 167 Completion Project Phase 1 Improvements area is currently subject to the FPPA and therefore a LESA is not necessary for this Re-evaluation. As shown in Exhibits 4.15-1 and 4.15-2, there are a number of properties that were considered farmland in 2006 but have since been converted to industrial uses. These properties are located primarily beyond the SR 167 Phase 1 Improvements footprint. The properties located within the footprint that are currently being used for agricultural purposes are also shown on Exhibits 4.15-1 and 4.15-2, but are not "Farmland" pursuant to the FPPA definition.

Many of these properties are now owned by WSDOT and leased to farmers on a year-to-year tenancy basis. At this time, there are nine WSDOT-owned parcels that total 123 acres currently under lease to Sterino Farms within the SR 167 Completion Project Phase 1 Improvements ROW. Another 6 parcels that total 26.2 acres of agriculture land is currently privately-owned and would be acquired for right-of-way purposes.

Local area farmers are finding it increasingly difficult to raise crops profitably in this area of rapid urban growth and development where property taxes on the land, now located within city limits, have risen dramatically.

Since historic agricultural farming practices were a dominant part of the local economies of Fife and Puyallup, the cities continue to support agricultural uses until such time as the lands are redeveloped to designated uses. The City of Fife allows farming activities in most zones. However, there are no agricultural designations in the Comprehensive Plan (City of Fife 2015). Instead, Fife preserves the farmers' right to continue farming and assures that they would not be restricted in their continued normal farming practices when development occurs around them. Similarly, the City of Puyallup's Comprehensive Plan (City of Puyallup 2015) notes that in portions of the Urban Growth Area, agricultural lands provide a land base for needed industrial development, served by water, sanitary sewer, railroad spurs, highway and arterial access. It is the City's policy to encourage agricultural production on those lands until such time as conversion for manufacturing and business/research park uses would occur.

The policy framework developed by the cities of Puyallup and Fife acknowledges the historical importance and desirability of agricultural lands. However, the jurisdictions have determined that agricultural land is not considered commercially viable long term and therefore there are no agricultural land use designations in the current comprehensive plans.

Some agricultural land along the project corridor falls within Unincorporated Pierce County. The County encourages agricultural activities as an appropriate land use throughout the rural area. The focus for preservation of agricultural lands according to County's comprehensive plan must be on lands not already characterized by urban growth (Pierce County 2016).

No agricultural lands fall within the City of Tacoma, Milton, or Edgewood along the Phase 1 Improvements Corridor.

Exhibit 4.15-1. Parcels along the Phase 1 Improvements Corridor Identified as Having Agricultural Use - Map 1 of 2

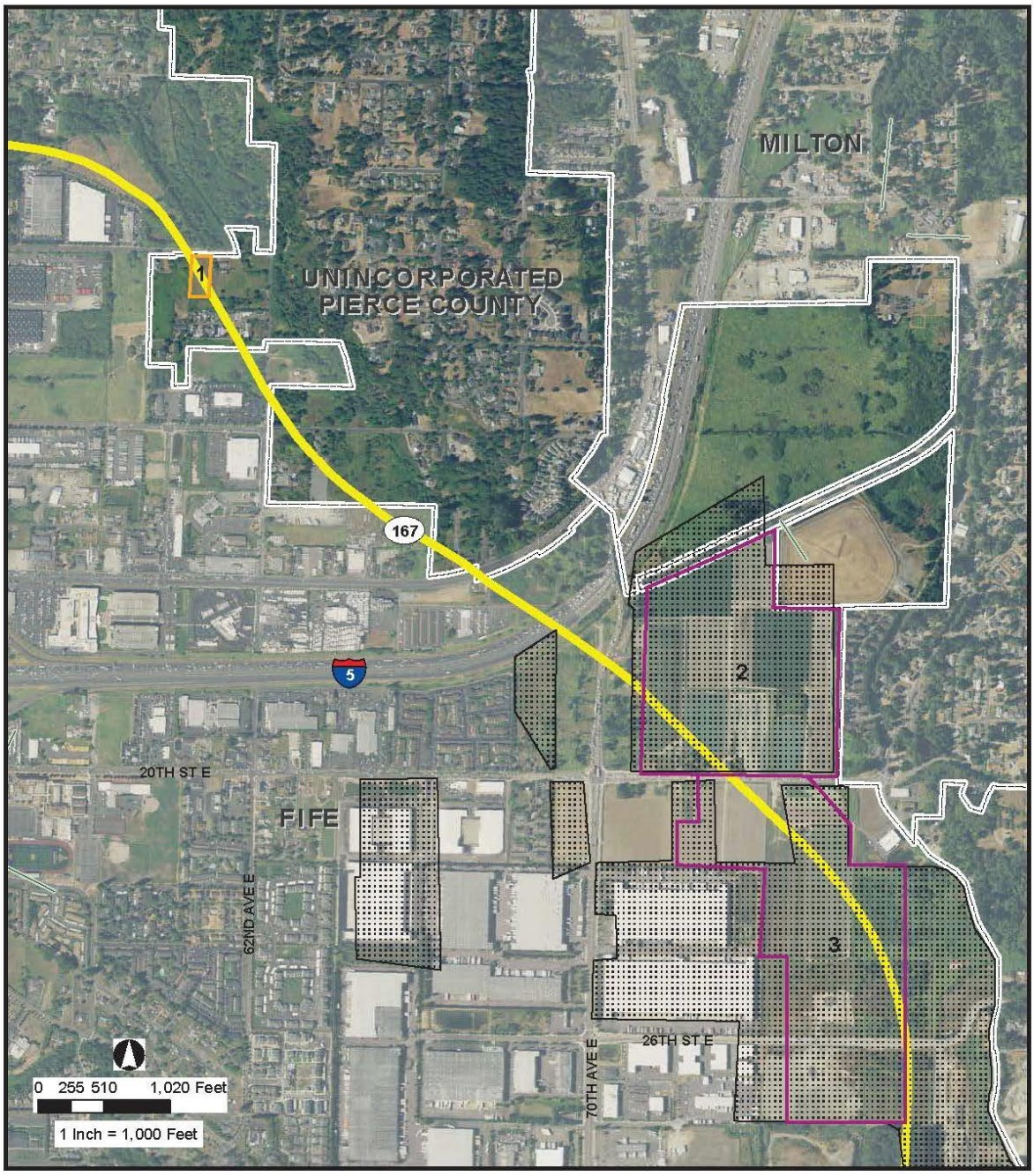
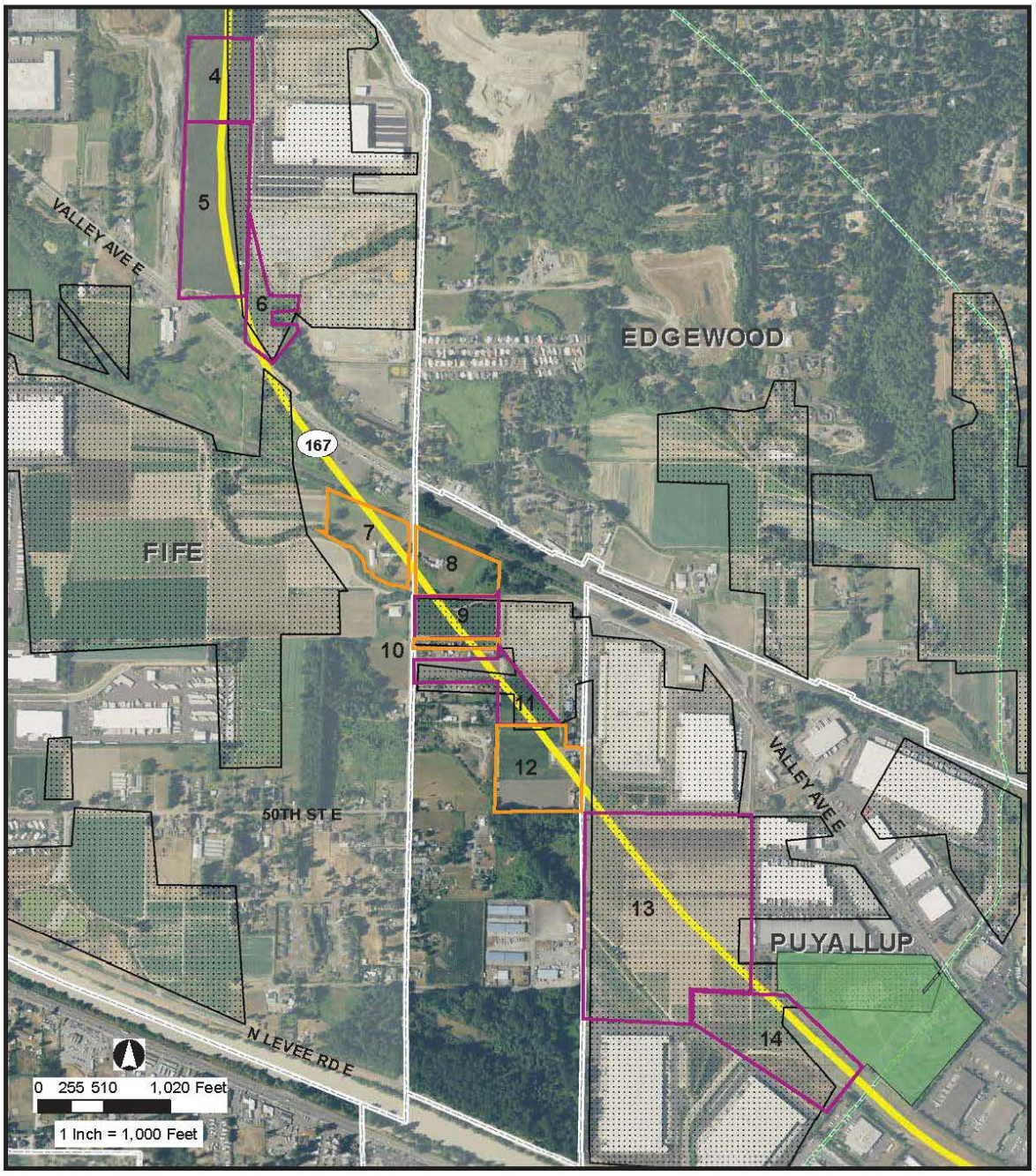


Exhibit 4.15-2. Parcels along the Phase 1 Improvements Corridor Identified as Having Agricultural Use - Map 2 of 2



Legend

- 2017 Land Used for Agricultural Purposes Along the Project Corridor
- Agricultural Land (Privately-Owned Property)
- 2006 FEIS-Identified Farmlands
- Proposed SR 167 Alignment
- Municipality
- Puyallup Tribe of Indians Reservation

Effects during Operation

The 2006 FEIS indicated that approximately 150-183 acres of farmland would be converted to transportation-related uses or for riparian restoration [pp. 3-331 of FEIS.]. The analysis also indicated that six different farmers would be affected and that the Washington Lettuce and Vegetable Company would be displaced.

The analysis conducted for this Re-evaluation indicates that approximately 235 acres of agriculture use property would be converted to transportation-related uses or for the Riparian Restoration Program (RRP) under the Phase 1 Improvements (Exhibit 4.15-3).

Exhibit 4.15-3. Property Acquisition Comparison by Land Use

	Residential (acres)	Commercial/ Industrial (acres)	Agricultural (acres)	Vacant (acres)	General/Public (acres)	Total (acres)
2006 FEIS						
2006 FEIS (ROW)	42-48	40-43	91-112	95-105	9-11	286-306
2006 FEIS (Riparian Restoration)	48-59	25-26	59-71	51	31	214-237
2006 FEIS Totals	90-107	65-69	150-183	146-156	40-42	500-543
Phase 1 Improvements						
Re-evaluation (ROW)	40	53	181	57	5	336
Re-evaluation (Riparian Restoration)	19	9	54	53	6	141
Phase 1 Improvements Totals	59	62	235	110	11	477

The activities of 5 different farmers would be affected by the Phase 1 Improvements as compared to the six that were identified in the 2006 FEIS. In addition, the Washington Lettuce and Vegetable Company has since sold to a developer that is actively marketing the property for commercial development. Because most of the affected agricultural use property is located within the area of the SR 167 Completion Project Phase 1 Improvements that would be impacted during a future stage, the current agricultural leases would be allowed to continue until approximately the 2024 timeframe, depending on project scheduling (Exhibit 4.15-4).

Exhibit 4.15-4. Agricultural Parcels Adjacent to Phase 1 Improvements Alignment

MAP ID on Exhibits 4.15-1 and 4.15-2	Tax Parcel ID	Current Property Owner	Agricultural Use Identification (Visual/WSDOT Agricultural Lease)	Size of Parcel (acres)
1	420063000	Robert Mattich	Aerial photo interpretation	1.15
2	420053005	WSDOT	Lease Information	53.3
3	420082069	WSDOT, New Sound Transportation LLC, Benaroya Capital Company	Lease Information/Aerial photo interpretation	47
4	420083005	WSDOT	Lease Information	15.9
5	420172008	WSDOT	Lease Information	16
6	420171702	WSDOT	Aerial photo interpretation	4.86
7	420174010	Anita Mastin	Aerial photo interpretation	6.7
8	420174039	Leanna Stidham	Aerial photo interpretation	5.98
9	420174002	WSDOT	Aerial photo interpretation	4.96
10	420174023	Sharon Boitano	Aerial photo interpretation	1.1
11	420174081	WSDOT	Aerial photo interpretation	6.24
12	420178009	Peter Tovoli	Aerial photo interpretation	9.71
13	420212068	WSDOT	Aerial photo interpretation	47.1
14	420212702	WSDOT	Aerial photo interpretation	15.3

As already mentioned, there are currently no "farmlands" as defined under the FPPA within the SR 167 Completion Project Phase 1 Improvements area. The lands currently in agricultural use are committed to urban development, and much of the land has previously been purchased for the SR 167 Completion Project Phase 1 Improvements ROW. Therefore, a Farmland Conversion Impact Rating form (NRCS-CPA-106) is not applicable, and was not completed for this Re-evaluation.

Effects during Construction

The 2006 FEIS identified temporary impacts of the Build Alternative on existing farmland as potentially including increased noise, dust, traffic detours, and traffic congestion. Other impacts identified as a result of construction were disruption of access to parcels being farmed and traffic delays. Because all WSDOT owned land currently leased for agricultural use would cease operation once construction of the SR 167 Completion Project Phase 1 Improvements begins, and additional parcels along the Phase 1 Improvements alignment currently used for agricultural purposes would be acquired, no temporary construction impacts on farmlands are anticipated. Construction in the immediate vicinity of other farmlands would produce increased noise, dust and/or air pollution, but is anticipated to have negligible effect on agricultural activities.

Mitigation

The 2006 FEIS identified operational mitigation measures to allow circulation options for movement of farm equipment and access to fragmented acreage due to bisecting of the proposed alignment. Under the Phase 1 Improvements no land used for agricultural uses would be bisected by the project. All WSDOT owned land currently leased for agricultural use would cease operation once construction of the project begins and additional parcels along the Phase 1 Improvements alignment used for agricultural purposes would be acquired. Therefore, no operational mitigation measures would be required.

Mitigation measures during construction for the proposed Phase 1 Improvements will be consistent with the mitigation identified in the 2006 FEIS. As provided in Section 3.12.6 of the 2006 FEIS, consultation and coordination with affected farmers will be conducted to ensure that disruptions to adjacent farming are minimized, and adequate advanced notice of potential temporary disruptions is given.

WSDOT has acquired the parcels near the Valley Avenue interchange area. These parcels will be converted to transportation use prior to start of construction, hence the need for coordination with individual farmers to develop circulation options for movement of farm equipment and to provide access to fragmented acreage in that area will be reduced. However, consistent with the 2006 FEIS mitigation, FHWA and WSDOT will attempt to provide access to local farmers from local streets by way of access roads and/or easements.

The 2006 FEIS described a private developer proposal to build a crossing over the SR 167 mainline east of the Puyallup Recreation Center to connect Valley Avenue to N Levee Road, and the crossing would accommodate tractors used in the fields. That crossing is no longer proposed, and therefore is not considered or part of WSDOT's planned mitigation. As the Phase 1 Improvements design progresses, WSDOT will determine if any alternative mitigation is necessary should farming continue on either side of the new highway during construction.

Prior to construction or operation of the proposed Phase 1 Improvements, those farms on private property that will be displaced as a result of WSDOT's property acquisitions will be eligible for relocation assistance. WSDOT's Real Estate Services Office implements the Relocation Assistance Program, pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act. WSDOT provides relocation assistance to persons displaced from residences, business, farms or nonprofit organizations by public works projects. Displaced farms are eligible for advisory services and monetary payments for moving and re-establishment costs.

Conclusion

No new significant impacts on farmlands from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. Rapid land development and urbanization has occurred since 2006, and parcels previously in agricultural use continue to be converted to commercial or industrial uses consistent with Comprehensive Plans and local zoning. There are no parcels in the project vicinity that meet the federal Farmland Protection Policy Act definition of "farmland." No new or revised mitigation measures are required as a result of the Phase 1 Improvements. See also Attachment M, Farmland Technical Memorandum.

4.16 Pedestrian and Bicycle Facilities, and Transportation Resources

Affected Environment

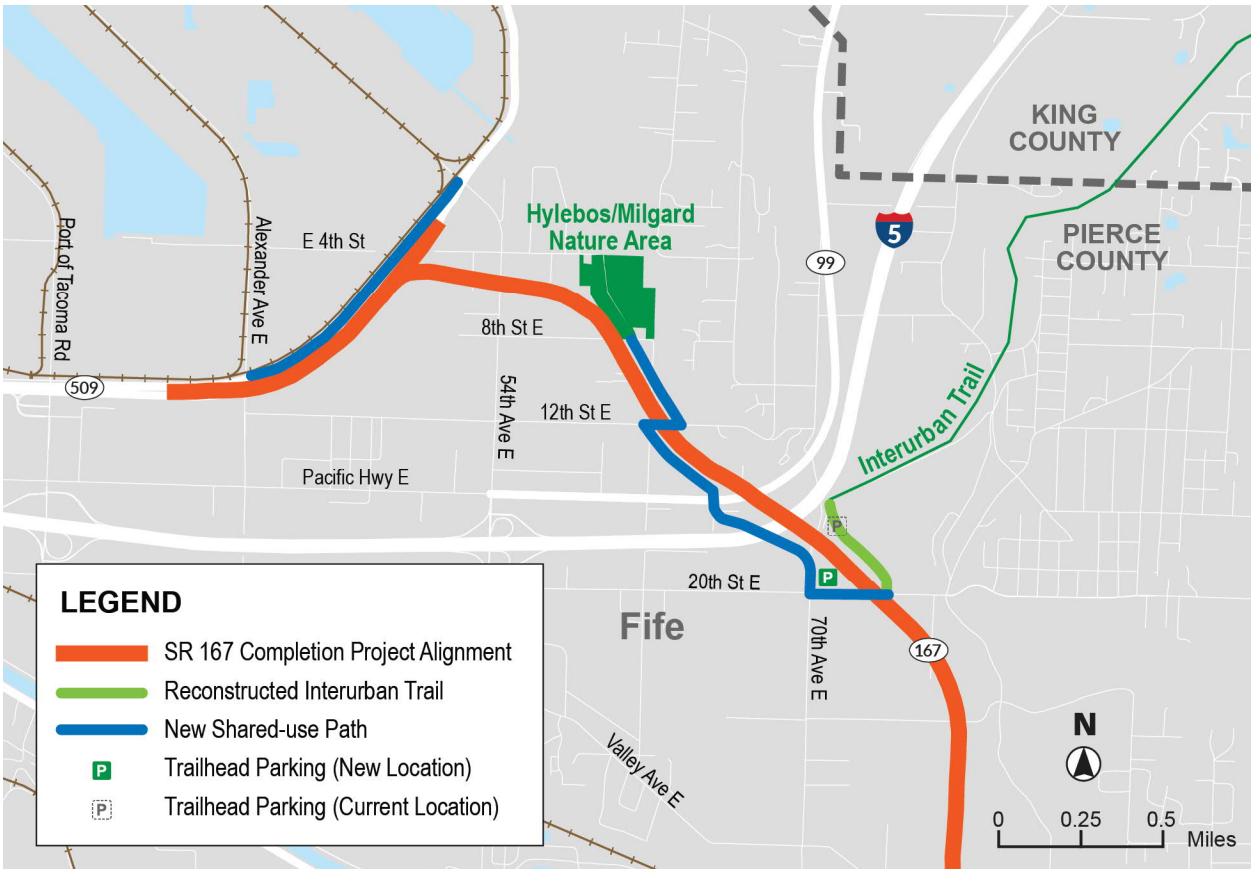
The affected environment relative to pedestrian and bicycle facilities and additional transportation related resources was described in Section 3.15.2 and Section 3.14.2 of the 2006 FEIS, and remains generally applicable to the proposed Phase 1 improvements. Some topics, such as coordinated transit and human services that were not specifically described in the 2006 FEIS are included in this analysis to fulfill the Re-evaluation requirements.

Features of the Phase 1 Improvements specific to pedestrian and bicycle improvements include the following:

- Relocation of the Interurban Trailhead parking from its current location to a new location along 20th Street E.
- Reconstruction of the Interurban Trail in an alignment easterly from its current location following the proposed SR 167 mainline alignment down to the new trailhead parking.
- Inclusion of a shared-use path on the east side of the proposed new 70th Avenue E structure over I-5 that would provide a vital connection for the active transportation community.
- Construction of a new shared-use path between SR 99 and 8th Street E along the mainline alignment of the proposed SR 509 Spur. Combined with the 70th Avenue connection cited above, this shared-use path will connect bicyclists and pedestrians between the east side of I-5 and the existing city of Fife Hylebos/Milgard Nature Area trail system, which provides an active transportation connection between 8th Street E and 4th Street E. The City of Fife is planning to identify or provide a bicyclist connection along 4th Street E between the north end of the Hylebos/Milgard Nature trail system and 54th Avenue East. WSDOT and the City of Tacoma are discussing the potential for establishing a connection between 4th Street E at 54th Avenue E to SR 509.
- Provision of a shared-use path trail along the existing SR 509 frontage road between 4th Street E and Alexander Road.

These improvements are shown graphically in Exhibit 4.16-1.

Exhibit 4.16-1. Proposed Active Transportation Improvements



Since publication of the 2006 FEIS, WSDOT has altered the categorization and description of bicycle facilities, as provided in Exhibit 4.16-2. These new designations would be used to describe the changes in this section in regards to existing and currently planned bicycle facilities.

Exhibit 4.16-2. WSDOT Roadway Bicycle Facility Types Ordered from Most to Least Protected

Shared-Use Paths	A facility physically separated from motorized vehicular traffic within the highway right of way or on an exclusive right of way with minimal crossflow by motor vehicles. Shared-use paths are primarily used by bicyclists and pedestrians, including joggers, skaters, and pedestrians with disabilities, including those who use nonmotorized or motorized wheeled mobility devices. With appropriate design considerations, equestrians may also be accommodated by a shared-use path facility. (M22-01.09 1515.03)
Raised and Curb-Separated Facilities	These facilities are considered protected because they are vertically separated from motor vehicle traffic. The raised and curb-separated facility is dedicated for bike users and delineated with pavement markings, signing, and in some cases pavement material. (M22-01.12 1520.02(1))
Separated Buffered Bike Lanes	Separated buffered bike lanes are at grade with the roadway, and they include a bike lane, a buffer area, and some type of vertical feature that reduces the likelihood of encroachment into the bike lane by motor vehicles and increases user comfort. (M22-01.12 1520.02(2))
Buffered Bike Lanes	The design is effectively the same as a separated buffered bike lane (above) without the use of vertical separators. (M22-01.12 1520.02(3))
Conventional Bike Lanes	Conventional bike lanes are at grade and adjacent to motor vehicle traffic lane and are designated by a single solid wide stripe between the motor vehicle lane and bike lane. (M22-01.12 1520.02(4))
Shared Lane Markings	Shared lanes are appropriate for lower-speed and lower-volume streets. Shared lanes employ pavement markings and signage to indicate the combined use. Shared lanes are more common in bicycle boulevards, establishing a complete network for cyclists within an urban or suburban environment. Shared lanes may be used on state highways within the ranges presented in 1520.03; however, it is more likely that shared lanes will interface with state highways through crossing situations. (M22-01.12 1520.02(5)

Source: Adopted from WSDOT Design Manual M22. July 2018 amendments incorporated.

Exhibit 4.16-3 illustrates the existing bicyclist routes within the project area as published by Pierce County in January 2018. Exhibit 4.16-4 illustrates some of the key existing and potential future bicyclist and pedestrian routes a person might use to get from the western portion to eastern portion of the project (SR 509 to SR 161). Existing bike facilities in the area include SR 99 between Milwaukee Way and Port of Tacoma Road in Tacoma, 54th Avenue E between 20th Street and the Dacca Community Park, along with several trail facilities such as the Milton Interurban Trail and sections of 70th Avenue E and 62nd Avenue E. Bicycle traffic is prohibited on I-5. The other roads in the study area are "shared roadways" with various levels of bicycle and pedestrian-accessible attributes. In many cases, these roads do not currently have adequate shoulders to safely accommodate bicyclists or pedestrians. There has been a substantial increase in bike facility mileage added by local jurisdictions and WSDOT since the 2006 FEIS.

Exhibit 4.16-3 Pierce County Bike Map in Vicinity of SR 167 Completion Project

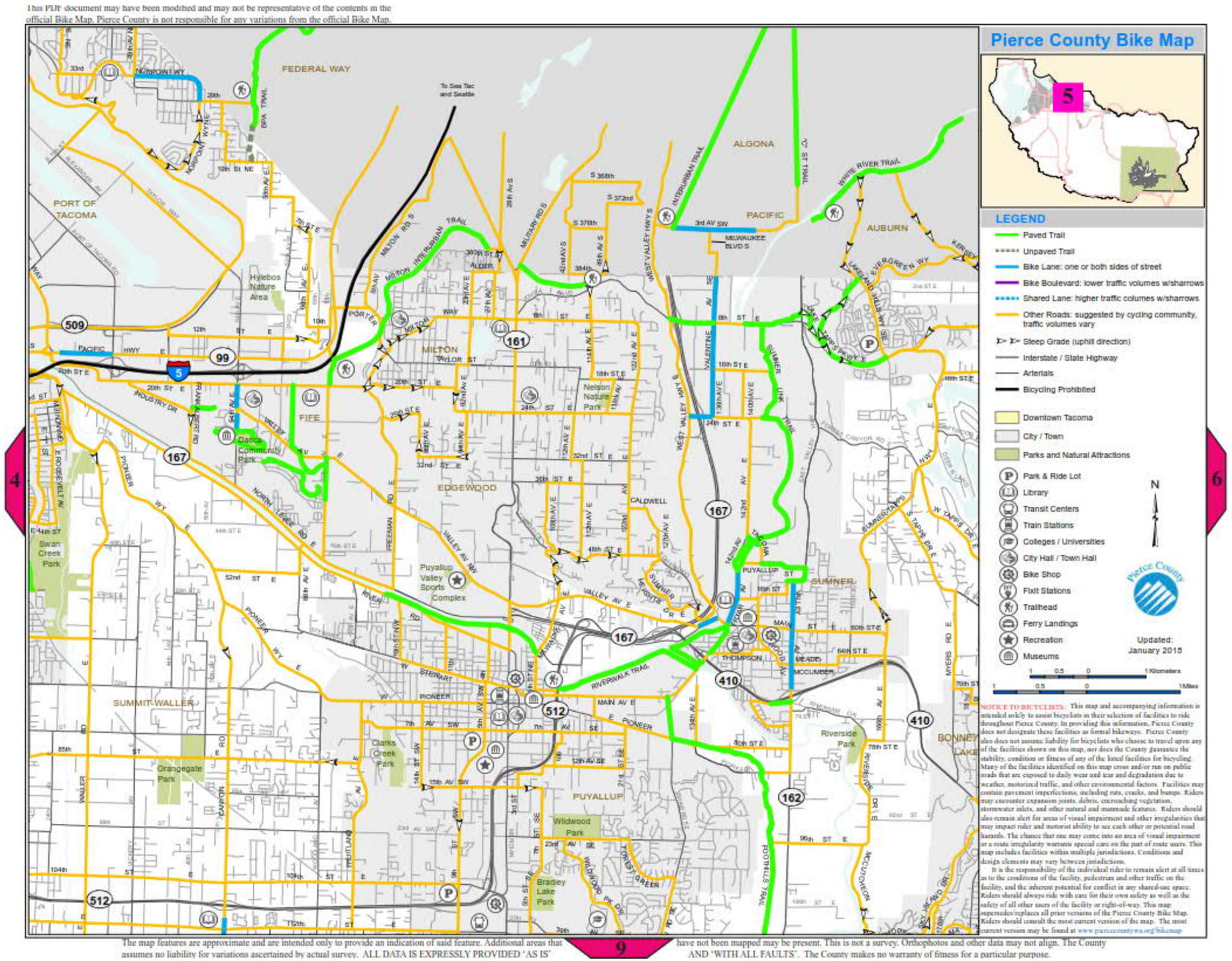
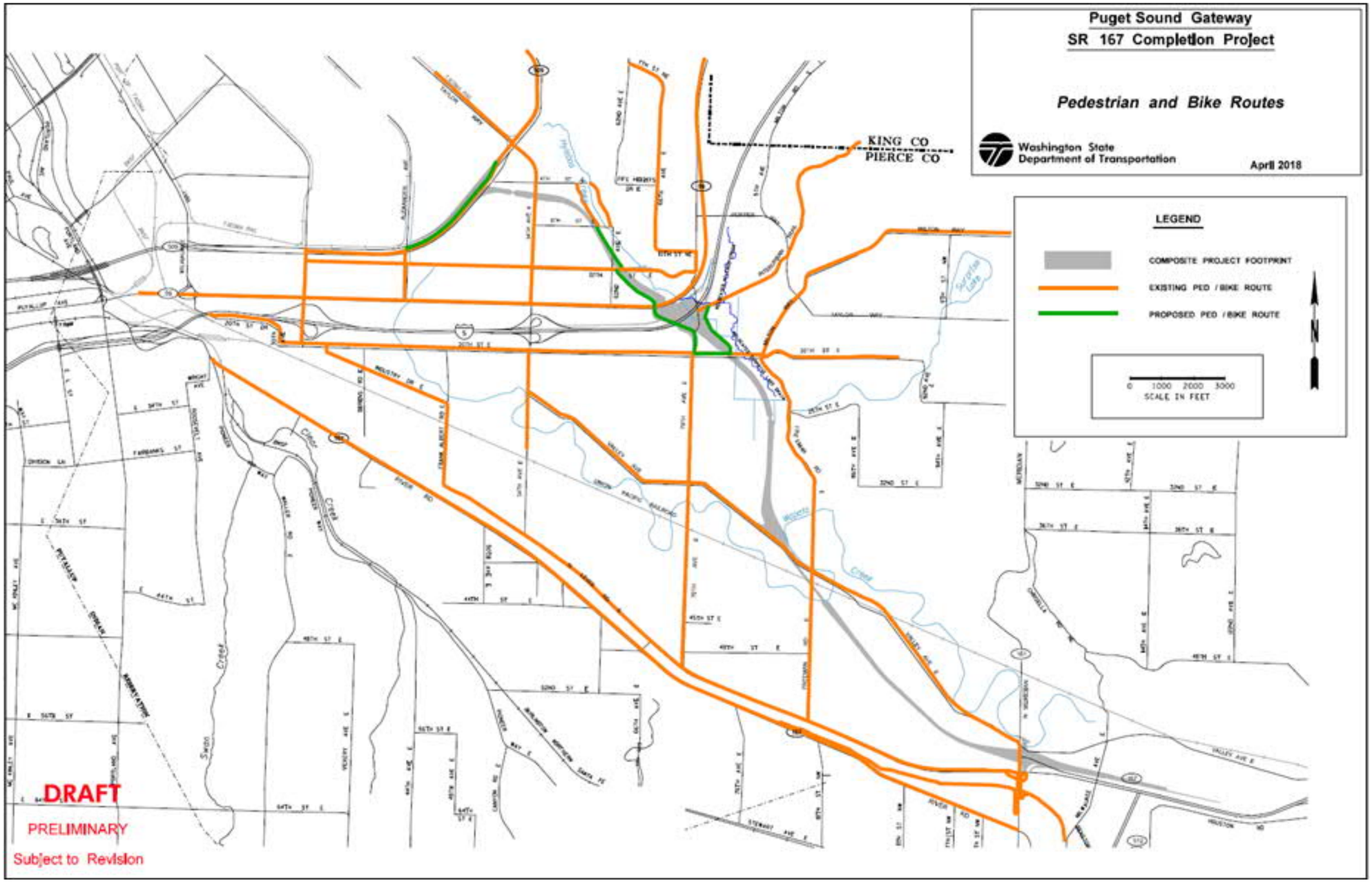


Exhibit 4.16-4 Pedestrian and Bike Routes



City of Tacoma and Port of Tacoma

The land adjacent to SR 509 near the Port of Tacoma and the proposed merging point with the new SR 509 Spur now includes auto and motorcycle dealerships, industrial supply and machinery businesses, several motels and other accommodations, warehouse/packaging, convenience stores, and vacant land. The area has multiple Commute Trip Reduction (CTR) worksites, which are required by The Commute Trip Reduction Efficiency Act to develop programs that encourages employees to find alternatives to driving alone, through a mix of elements, such as an employee transportation coordinator and transportation events.

Beyond common shared roadway facilities, the existing roadway network does not have adequate accommodations for bicyclists, though it has seen an increase since the 2006 FEIS. SR 509 and 54th Avenue E both have bike lanes, as does SR 99, although the lane is not continuous, meaning that the bicyclist facility is intermittent. Many of the intersections in the area have limited pedestrian infrastructure. Although the Pierce County Bike Map. “Other roads” (orange) in the legend of Exhibit 4.16-3 shows infrastructure that is “suggested by the cycling community: traffic volumes vary” as possible bike facilities, the statement made in the Tier II FEIS that “the roadway system in this area is likely to be traveled by only the more experienced bicycle riders”, is still valid. The City of Tacoma currently has undetermined and unfunded plans to complete the bicyclist facilities on SR 509 from Fawcett Avenue west of I-705 to residential areas near Browns Point north of the study area. WSDOT also plans to construct a shared-use path between Alexander Avenue E and Taylor Way, leveraging the existing infrastructure and signals at these locations. These improvements are different from what was planned at the time of the 2006 FEIS, however, it is expected to further enhance the planned bicyclist and pedestrian infrastructure in the SR 167 Completion Project, by improving connections and facilities for pedestrian and bike users, in addition to WSDOT’s planned Phase 1 Improvements.

City of Fife

Land use in the City of Fife currently includes a mixture of residential, commercial, industrial manufacturing, and agricultural uses. The main residential areas are in the center of the city, north of the Puyallup River, east of Frank Albert Road E and west of 70th Avenue E. The area has seen increasing development since the 2006 FEIS and several larger parcels are still being developed for residential use within this area. These areas are expected to generate a higher level of active transportation demand as development continues to replace unimproved property sites, which further supports the benefits of completing the SR 167 Completion Project Phase 1 Improvements and associated pedestrian and bicycle facility features. Based on the City’s Comprehensive Plan (City of Fife 2005), there is one designated Urban Growth Area, located north of I-5 between the east city limit and 54th Avenue E and 62nd Avenue E.

In the 2000s, increasing industrial and commercial development occurred within the City of Fife. This development resulted in roadway shoulders and sidewalks being built; however, at that time, Fife lacked the land uses and population density necessary to generate substantial volumes of bicycle and pedestrian demand. This remains the case today, although the City continues to establish and improve its biking and pedestrian infrastructure. Most of the roadways and roadway corridors within the City have been designated as primary bikeways, or sidewalk and trail links in the City of Fife transportation plans. All roads are currently shared facilities. Sidewalks are present on larger north-south corridors and along main roads, such as 20th Street E on which the Fife High School and Public School Administration

offices are located. However many smaller residential streets do not have pedestrian infrastructure and only major intersections have pedestrian signals.

In 2012 the City of Fife published an update to its Comprehensive Plan, which included a discussion of current and planned bike and pedestrian facilities. The City's planned improvements are anticipated to decrease the number of miles of sidewalk gaps from 12.4 miles to 4.8 miles in the entire City, with a decrease from 6.8 miles to 2.3 miles in the pedestrian priority area. The planned improvements by the City of Fife also include the installation of nine new signalized intersections, most of which would be installed on 20th Street E (City of Fife, 2014). The 2012 Comprehensive Plan also includes facilities that would connect the existing bicycle and pedestrian infrastructure in the area with a combination of bike lanes, designated shared roadways, and trail improvements. With the identified improvements, the City of Fife expects to increase its bicycle facility mileage from 15.9 miles to between 28.2 and 44.0 miles, depending on the implemented projects.

There are multiple proposed trails within the City of Fife. The Puyallup River Trail is proposed as part of the reconstruction of the Puyallup River Levee by the Army Corps of Engineers, and was called the North Levee Trail in the 2006 FEIS. The trail project is contained in the City of Fife's active transportation plans; however, no completion date has been identified. The area of trail access improvement is located beneath the SR 167 bridge (at N Meridian Ave) and borders the Puyallup River. The proposed "Wapato Creek Nature Trail" extension is a paved shared use path that extends through the SR 167 Completion Project Phase 1 Improvements right-of-way. The trail, as proposed by the City of Fife, would extend along the creek southeast through the city of Fife to the Union Pacific Rail Road (UPRR) on southern limits to Freeman Road. Part of the proposed trail would be located on Puyallup Tribe of Indians tribal property. Consistent with the situation described in the 2006 FEIS, the Puyallup Tribe is not supportive of the City of Fife's Wapato Creek Trail proposal. Additional coordination, consultation, and agreements will be required before this facility is legitimately recognized and moved forward.

The existing Interurban Trail extends from King County into Pierce County, through the City of Milton, ending at a new trailhead just before I-5 at 70th Avenue E. The 2006 FEIS included plans to construct the proposed Pacific National Soccer Park, located north of 20th Street E and east of 70th Avenue E, which would have required additional parking to service the Interurban Trail. However, the City of Fife's proposal for the soccer park was dropped, and is no longer planned or being considered within the SR 167 Completion Project Phase 1 Improvements travel shed. The population of Fife has more than doubled from 4,784 in 2000 to an estimated 10,103 in 2016, which may further increase the expected usage of the planned pedestrian and bicycle facilities and infrastructure beyond the estimates of the 2006 FEIS.

City of Puyallup

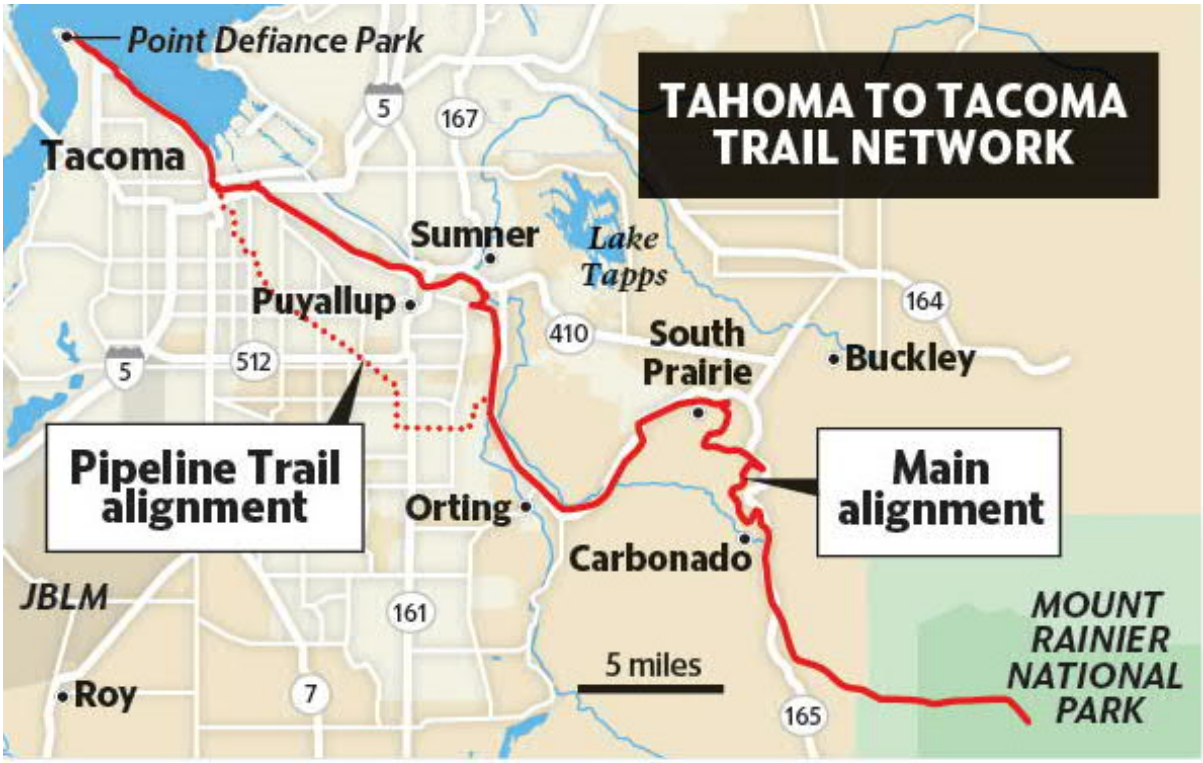
The study area used for this analysis includes only the northern section of the City of Puyallup, referred to as North Puyallup, which is located north of the Puyallup River. The current zoning in this area is primarily limited manufacturing, interspersed with public facilities, as was described in the 2006 FEIS. However, East of Spencer Road, the zoning has since then been changed from manufacturing to general commercial and high-density, multi-family residential to accommodate the growing population. This means that there is an increasing need for varied transportation facilities, and an increasing number of people to make use of them, further incentivizing investment in active transportation travel.

The Puyallup Recreation Center, located at Valley Avenue E and 7th Street Northwest, is adjacent to the proposed SR 167 Phase 1 Improvements alignment and consists of ball fields and 25,000 square feet of indoor space with no existing plans for expansion. The automobile remains the overwhelming travel

mode choice for users of the Recreation Center, although the City of Puyallup's 2015 Comprehensive Plan (City of Puyallup 2015) describes opportunities for improving sidewalk connectivity to and from the recreational center. Roads serving this site are designated as shared roadways with sidewalks, and the Recreation Center can also be accessed from a variety of different shared-use paths.

In March 2016 the Active Transportation Community of Interest (ATCOI) under the Puyallup Watershed Initiative (PWI) published their report Tahoma to Tacoma Trail Network, proposing a 62-mile multi-use recreational trail between Mount Rainier, through Carbonado, Wilkeson, South Prairie and ending in Commencement Bay/Point Defiant Park. A proposed general alignment can be seen in Exhibit 4.16-5. While the proposed alignment is currently outside of the SR 167 Completion Project Area, the final alignment is still being explored by interested parties. There may or may not be opportunities to connect to active transportation infrastructure within the SR 167 Completion Project Phase 1 Improvements' pending further discussion and collaboration between the stakeholders.

Exhibit 4.16-5. Tahoma to Tacoma Trail Network



City of Milton

The study area that is west and south of Porter Way extending along I-5, known as the south Milltown District, includes a portion of the City of Milton, and has seen substantial changes in zoning and land use since the 2006 FEIS. Existing land use in this area is primarily low density single-family residential, commercial, and vacant land, though residential land use has been, and continues to increase. The area is zoned commercial and light manufacturing. The City of Milton has designated several roads in the study area as Bicyclist/Pedestrian Routes, including Porter Way, 5th Avenue, and Kent Street, which is an improvement to active transportation facilities since release of the 2006 FEIS. None of the roads have paved shoulders or sidewalks, and are sloped with moderate to extreme grades. The City's West Milton Park is considered a local active transportation site destination and is served by a shared roadway and

the Interurban Trail. The Interurban Trail terminates at 70th Avenue E, adjacent to I-5. The City's most recently adopted Comprehensive Plan (City of Milton 2015) describes improvements the City is looking to implement. These include several projects targeted at pedestrians and bicyclists, such as undetermined active transportation facilities, rectangular rapid flashing beacons in pedestrian crosswalks, several sidewalks, and an uphill bicyclist climbing lane. The improvements are planned on Porter Way, 5th Avenue, 20th Street East, Fife Way E, Kent Street, and on the Interurban Trail along with several other locations outside of the SR 167 Phase 1 Improvements study area. As discussed in a previous section, the affected cities' commitment to provide connections to the planned SR 167 Completion Project Phase 1 Improvements facilities further exacerbates the positive impacts these investments would have.

City of Edgewood

The City of Edgewood has a variety of roads "suggested for cycling" according to the Pierce County Bike Map, as previously discussed. It furthermore has a section of the 'Interurban Trail', which is currently not connected to other parts of the 'Interurban Trail', though the City hopes to connect these in the future. There is an existing pedestrian and bike route along Meridian Avenue E between the north city limits and 24th Street E. Active transportation facilities were recently improved as part of the Meridian Avenue E widening project. Future plans include extending these south to 36th Street E.

Pierce County

A small portion of unincorporated Pierce County lies within the study area adjacent to the cities of Fife and Tacoma, east of 54th Avenue E and south of the King/Pierce county border. There is also a small unincorporated area of Pierce County bounded by Valley Avenue E to the north, N Levee Rd E to the south, 82nd Avenue E to the west, and 86th Avenue E on the east. This area does not have any dedicated active transportation facilities.

These areas remain unincorporated, and no changes to the area have occurred compared to conditions documented in the 2006 FEIS. Overall, no substantial changes or developments have been identified, which would impact pedestrian or bicycle facilities differently or to a greater degree, as compared to the 2006 FEIS. The infrastructure and facilities improvements that have been implemented since the 2006 FEIS are concurrent with the overarching goals of active transportation improvements of the most recent comprehensive plans. The content of the 2006 FEIS remains valid with state plans and strategies for improving safety and increasing mobility via pedestrian and bicycle facilities.

Additional Transportation-related Resources

The bounds of the proposed Phase 1 Improvements are similar to those described in the 2006 FEIS, however the total size of the Phase 1 Improvements is smaller, leading to less affected environment than was originally documented. The 2006 FEIS contained information regarding bus transit, rail operations and park-and-ride lots, which would be compared further below. However, except for discussion regarding mitigation, the 2006 FEIS did not include information on transportation demand management (TDM), transportation system management (TSM); intelligent transportation systems (ITS); coordinated transit; and human services and special needs, which is also described below.

Transit Services, and Park-and-Ride Lots

Bus Transit

The project lies within the Pierce County Public Benefit Area and the Central Puget Sound Regional Transit Authority (Sound Transit) service boundary, as well as within the Intercity Transit's service area. Pierce Transit provides bus service within the SR 167 Phase 1 Improvements area. Local routes connect Tacoma and Fife with Federal Way, Puyallup, Steilacoom, Spanaway, Ruston, Milton, and other areas.

Pierce Transit and Sound Transit (ST) also operate express bus service on I-5, connecting Tacoma with Lakewood and Seattle, as well as with Olympia and the Olympic Peninsula. The Tacoma Dome Station, a 2,400-stall facility, serves as a transportation hub for local transit service and regional express service connections for ST Express bus service. The station also serves as a destination for ST commuter rail's Seattle/Tacoma connection. A Greyhound and Northwestern Trailways bus terminal with services to Seattle and Portland via I-5, as well as Spokane, Wenatchee, and Boise, Idaho are also located in the vicinity. The Tacoma Dome furthermore sees transit from Intercity Transit, serving Olympia, Tumwater, Lacey, and Yelm with routes terminating at the Tacoma Dome.

Altogether, these ST routes have more than 8,000 average weekday boardings. Though there are some changes to bus routes, as well as increases in weekday boardings, there are no substantial changes in terms of impacts on the SR 167 Completion Project's Phase 1 Improvements.

Rail Operations

Existing rail lines in the northern Pierce County provide passenger and freight service between the Seattle-Tacoma and the Portland metropolitan areas. The Amtrak Coast Starlight, Thruway and Amtrak Cascade use the Burlington Northern and Santa Fe (BNSF) Railway mainline 10 times daily for passenger service through Seattle and Tacoma, with less frequent service on the weekends. The BNSF mainline is located on the south side of the Puyallup River and is not directly affected by the SR 167 Completion Project Phase 1 Improvements. This is consistent with changes to the conditions documented in the 2006 FEIS.

The UPRR mainline operates a single track through the southern portion of the SR 167 Completion Project Phase 1 Improvements area. The mainline tracks are part of the UPRR Seattle-to-Tacoma mainline. Railroad yard facilities are located south of I-5, near Frank Albert Road. South of Tacoma to Portland, Oregon, UPRR trains operate on BNSF tracks. Approximately 16 trains each day use the Seattle-to-Tacoma mainline, which is the same as described in the 2006 FEIS.

ST commuter rail service, established in September 2000, operates the "Sounder Train" which runs between Lakewood and Seattle via Tacoma 26 times per day on the BNSF mainline. This service currently averages more than 15,900 passengers daily between Seattle and Tacoma, passing through the Port of Tacoma area. This is a substantial increase since release of the 2006 FEIS which described the train as operating four times a day, carrying around 3,000 passengers.

ST also operates the Tacoma Light Rail which runs between the Theater District/South 9th Street and the Tacoma Dome Station. ST's long-term plans are to connect the existing light rail network in Tacoma with the Link light rail in Seattle through Federal Way, Kent/Des Moines, and the Tukwila International Boulevard Station and ending in Ballard. This suggested expansion would be located nearby the I-5 and proposed SR 167 Phase 1 Improvements right of way, stopping in East Tacoma just before the study area, and in Fife, where additional parking would be added to the Tacoma Dome Station. The final alignment of this improvement is yet to be decided. Furthermore, ST was granted a $75 million to expand the western Tacoma link Light Rail section further west through downtown Tacoma, Hilltop District and Stadium District. This latter proposed ST work would not directly impact the study area, but further improves the current expansion and development of transit services, which would eventually be connected near the SR 167 Completion Project Phase 1 Improvements study area.

Park-and-Ride Lots

The 2006 FEIS and 2007 ROD documented the commitment to locate two park-and-ride lots within the SR 167 Completion Project Phase 1 Improvements' acquired right-of-way. However, limited funding was allocated in the Connecting Washington funding package for the Puget Sound Gateway Program and

WSDOT worked with local jurisdictions and other key agency stakeholders—including Pierce Transit and Sound Transit—to develop the scope of Phase 1 of the SR 167 Completion project which did not include any park-and-ride lots. Pierce Transit has stated via an email to WSDOT (February 2017) that they no longer have an interest in a park-and-ride lot near the future Valley Avenue interchange as it is not consistent with their updated Transit Development Plan: 2018–2023 or its Destination 2040 Long Range Plan. A second site that had been selected for a park-and-ride lot near the SR 161 interchange also is not consistent with Pierce Transit's current and long range transit plans. This property has also since developed into a car dealership. Looking forward, however, a future phase(s) of this project could include further discussions with both Sound Transit and Pierce Transit with regards to the need for park-and-ride facilities, including secure bicycle parking needs.

Transportation Demand Management, System Management, and Intelligent Transportation Systems

TDM includes various strategies to encourage more efficient travel patterns and behaviors (https://www.wsdot.wa.gov/Choices/TDMQnA.htm). TDM efforts provide multiple benefits, including reduced traffic congestion, road and parking facility cost savings, user financial savings, increased road safety, increased travel choice (especially for nondrivers), increased equity, reduced pollution, and energy savings. TDM does not refer to any specific strategy or program, but incorporates a variety of initiatives with the goal of better utilization of the existing infrastructure and transportation systems. One example of TDM is the use of high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes, of which the latter are present on northern sections of existing SR 167 in King County. Currently, there are no HOT lanes in Pierce County, and HOV lanes exist on I-5 in Pierce County from the King/Pierce county line south to the 54th Avenue interchange.

There are several completed and planned projects under the WSDOT I-5 SR 16 Tacoma/Pierce County HOV Program, as well as projects currently under construction. Completed projects include HOV lanes on I-5 between Alexander Avenue E and the Pierce/King County border in both directions, as well as several preparatory projects widening existing I-5 infrastructure and preparing for HOV connections. Currently under construction is a northbound HOV lane between Portland Avenue and Port of Tacoma Road, as well as bidirectional HOV lanes on I-5 between M Street and Portland Avenue. Both are anticipated to be completed in 2018. The former also includes work on the interchange and surrounding infrastructure that would support the connection of the proposed SR 167 Phase 1 Improvements to I-5. Planned projects include a southbound HOV lane from Portland Avenue and Port of Tacoma Road, for which construction would begin once the northbound HOV lane is completed by the end of 2018, and then continuing for three years with an expected completion date at the end of 2021. Several projects in the WSDOT HOV Program are not currently funded; including in the SR 167 Completion Project Phase 1 Improvements study area, the SR 512 Vicinity to 15th Street Southwest Project which would improve and widen existing SR 167 and extend HOV lanes south to Puyallup along the corridor.

Ridesharing is widely used in Pierce County in the form of public transit, and as vanpools and carpools, with 0.81 million annual users in 2017. Some of these are organized centrally by transportation authorities and/or supported and mandated by individual workplaces, while others are organized through mobile applications or privately owned websites. Ridesharing is a way to decrease the number of the cars driving the same route at the same time, substantially increasing the efficient use of the infrastructure when used.

Pierce County plans to continue to improve TDM strategies through grant seeking; partnerships with neighboring transportation authorities, such as WSDOT, the Puget Sound Regional Council (PSRC) and

the surrounding cities; programs and marketing targeting places of employment; and a focus on increasing car sharing.

Intelligent Transportation Systems (ITS) includes various technologies that support and enhance travel, primarily on state highways. It is primarily used and managed by WSDOT. Using a combination of different technologies, such as Bluetooth and Wi-Fi, ITS enables data collection on roads, which serves several different purposes including informing operation managers at the WSDOT Traffic Management Centers (TMC) of current traffic conditions and providing information to travelers. Examples of the use of ITS includes active traffic management (ATM), which allows for variable speed signs which display posted speed limits to be increased or decreased based on current conditions, or for lanes to be closed in the case of accidents. Another example is the use of ramp metering technologies, which controls inflow to mainline traffic from on-ramps, attempting to smooth out merging action to avoid bottlenecks and merge-related slowdowns. WSDOT operates six TMCs across the state, one of which is in Tacoma. These centers monitor traffic on camera and with the use of traffic detectors to respond to conditions. They operate reversible lanes, coordinate with the Washington State Patrol and incident response teams, and provide current traffic conditions and warnings, and other activities. Several ITS initiatives are in use in Pierce County other than the TMC, including the use of variable message signs (VMS) that inform drivers of construction activities, current travel times, and other activities that may impact traffic, such as sports games, and ramp metering to control the flow of cars on on-ramps. Pierce County also uses traffic data collectors, such as in-pavement induction loops, highway advisory radios, road/weather information systems, and traffic cameras. Currently there is no ATM in Pierce County, although areas around Joint Base Lewis McChord are being evaluated for the installation of ATM.

Commute Trip Reduction

The goals of the Washington State Commute Trip Reduction (CTR) program are to reduce traffic congestion, reduce air pollution, and reduce petroleum consumption through employer-based programs that decrease the number of commute trips made by people driving alone. CTR program results are achieved through collaboration among local jurisdictions, employers, and WSDOT. The state's nine most populated counties (including Pierce County), and the cities within those counties, are required to adopt CTR ordinances and support local employers in implementing CTR (WSDOT 2018). Employers are required to develop a commuter program designed to achieve reductions in vehicle trips and may offer benefits such as subsidies for transit fares, flexible work schedules, and work-from-home opportunities. WSDOT could provide technical assistance to local jurisdictions and employers in the SR 167 Completion Project area to help implement the CTR program. Technical assistance includes training, support with data collection and analysis, and maintaining networks of partners and documentation on best practices. Both TDM and CTR also include support for bike commuting and pedestrian/bicyclist access to transit services that would benefit from infrastructure improvements to be made as described above.

Rideshare Information and Assistance

WSDOT has an ongoing program that provides commuters with information about using transit services and ridesharing to get to and from work. This information service also provides commuters with an easy way to find others who are interested in sharing their commute in a carpool or vanpool. In addition, ride-match services to regional events, such as the annual Western Washington Fair in Puyallup, help individuals find others who want to share a ride to the event. Rideshare information in and near the SR 167 Completion Project corridor is available at major employers, social service providers (state/county/city offices, hospitals, etc.), transit agencies, and all WSDOT offices. Commuters can also request a ride-match or receive information about carpooling/vanpooling at WSDOT's Rideshare Hotline number (1-888-814-1300), or online at http://rideshareonline.com/.

Coordinated Transit, Human Services and Special Needs

In 2005, Congress passed federal legislation requiring regions that produce an MTP to include a regional "Coordinated Transit-Human Services Plan" component to serve as a strategy for improving coordination between a region's transit service providers and increasing transit availability to customers with special needs. This plan must be an element of the region's MTP. The PSRC and the separate counties have in recent years increased their focus on providing coordinated transit, replacing the focus on transit for the physically disabled only, to providing services for Persons with Special Transportation Needs, defined as:

… those persons, including their personal attendants, who because of physical or mental disability, income status, or age are unable to transport themselves or to purchase appropriate transportation.

This group generally includes children, seniors, individuals with a disability, and low-income individuals. In 2014, PSRC published its Coordinated Transit-Human Services Transportation Plan 2015-2018 (PSRC 2014), which guides and informs the Pierce County Coordinated Transit-Human Service Transportation Plan (Pierce County 2015b). Pierce County has, along with Kitsap County, the highest relative number of transit riders with special needs in the Puget Sound region.

Under coordinated transit, children age 5 to 17 years are considered special needs as they usually do not have any mobility options of their own outside those of their parents. Pierce County has the highest percentage of children in the PSRC area, with 18 percent of the county population 17 years of age or younger. Seniors in the Puget Sound area comprise 11 percent, with most populations located in denser areas such as Tacoma. Seniors often have a need to attend more health-related appointments than the general population, which may be difficult if adequate transportation is not available. The same is true for people with a disability who often need to attend places of employment, education, and health care; therefore, their transportation needs are considered as well. In 2016 the poverty rate in Pierce County was 12.1 percent. Low income or poverty often means that the family does not have access to vehicular transportation, relying on the bus system to get to their places of employment, education, child care, health care, social services, and others. 8.2 percent of households in the Puget Sound region do not own a car. Pierce County has the region's highest proportion of low-income residents.

The Pierce County Coordinated Transportation Coalition (PCCTC) represents human services agencies, private and nonprofit transportation providers, the Medicaid transportation broker, local public transportation agencies, and people who use transportation services. The PCCTC works to make it easier for seniors, individuals with disabilities, and people with low incomes to get to work or school, medical or social service appointments, shopping, recreation, and social activities. The PCCTC develops the local Coordinated Transit-Human Services Transportation Plan outlining strategies to meet the ever-increasing transportation needs throughout Pierce County. PCCTC currently provides the following services through the partners described in Exhibit 4.16-6.

Pierce County would continue efforts to improve transit for individuals with special needs, and plans to close gaps in the transportation system and increase awareness of the needs of this group of transit users.

Exhibit 4.16-6. Coordinated Transit Service Providers in Pierce County

Pierce Transit	Provides fixed-route bus service, shuttle demand response service, and vanpool within the public transportation benefit area. Also, is the project sponsor for the Adult Day Health Express, a partnership between Multicare Health Systems and Pierce Transit to provide coordinated transportation to program participants.
Pierce County Community Connections	Provides transportation connections for eligible riders in south and east Pierce County who live outside of the Pierce Transit service area. This service is called Beyond the Borders. This agency is also the fiscal agent for Mobility Management funds, which supports and coordinates the coalition and a travel ambassador program.
Mustard Seed Project	Provides volunteer transportation for seniors and persons with disabilities on the Key Peninsula.
Paratransit Services	Arranges for transportation to medical-related appointments for people receiving Medicaid benefits. Multiple private providers provide the trips.
Catholic Community Services	Provides volunteer transportation services for seniors and adults with disabilities.
Puget Sound Educational Services District	Provides transportation for pre-school-age children, as well as homeless children. It also sponsors a program called Road to Independence that provides training to recipients of a social service program on how to be a driver or dispatcher; trained individuals drive eligible riders to work or education opportunities.
United Way of Pierce County	Provides a one-call/one-click transportation resource center; 2-1-1.
Key Peninsula Community Council	Provides community transportation in the Key Peninsula on out-of-service school buses with a program called KP School Bus Connects.

Source: Adopted from the PCCTC Coordinated Transportation Plan

In summary, the changes to the existing environment since the 2006 FEIS are summarized as follows:

- An increasing amount of bicyclist facilities are available in the project area and in the region, as a whole.
- The Pacific National Soccer Park is no longer planned, resulting in lower parking requirements in the area.
- The Tahoma to Tacoma Trail proposed by ATCOI, the PWI has the possibility of connecting to the SR 167 project, further increasing the benefits for both projects.
- The Sounder Train has seen an increase in number of trains and boardings, from four trains per day with 3,000 boardings, to 26 trains per day with 16,000 boardings, since the 2006 FEIS.
- Sound Transit is planning on expanding the Tacoma Link Light Rail east, as well as eventually connecting this service to the northern Seattle Link Light Rail, providing service through the two counties.
- Coordinated Transit and the Commute Trip Reduction program continues to expand and develop, as does the number of ridesharing services and users.

Effects during Operation

The impacts related to pedestrian and bicycle facilities and transportation-related resources from the proposed Phase 1 Improvements are not substantially different from what was described in the 2006 FEIS. This section summarizes key changes described in the previous section.

Pedestrian and Bicycle Facilities

Since publication of the 2006 FEIS, various authorities operating within the study area have been extending and improving bicycle and pedestrian facility infrastructure. The SR 167 Completion Project's Phase 1 Improvements would provide some of the pieces of the improved active transportation network. The SR 167 Completion Project Phase 1 Improvements may result in temporary closures, permanent rerouting and/or re-designation of pedestrian and bike facilities, but no net loss of infrastructure will occur, in accordance with WSDOT policy (WSDOT 2008). A change from the proposed 2006 FEIS project is the preclusion of bicyclist access to the SR 167 mainline between 20th Street E and SR 161. The 2006 FEIS states that SR 167 mainline access from 20th Street East will be available to bicyclists traveling between 20th Street East and SR 161. The intent of the SR 167 Completion Project Phase 1 Improvements is to provide a vital connection with an emphasis on freight connections and mobility. Due to concerns related to the general incompatibility of freight and bicycle modes, and the requirement to navigate through the Valley Avenue interchange, it has been decided not to allow bicyclists on any portion of the new SR 167 mainline Phase 1 facility. This condition can be revisited for a potential future phase(s) facility. Bicyclists will be more safely served using the surrounding transportation infrastructure which includes an increase in the extent of bicycle routes available. The project will also provide a new active transportation connection along the new 70th Avenue bridge over I-5 connecting into the relocated Interurban trail off of 20th Street East. Additionally, and consistent with the 2006 FEIS, the project will provide a shared use connection from SR 99 and 70th Avenue E along the new SR 509 Spur alignment north to the Hylebos/Milgard Nature Area. The changes from the 2006 FEIS regarding bicyclist access to SR 167 are mitigated by the increase in active transportation facilities and infrastructure in the surrounding environment, and was not found to require additional mitigation by the project. The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to pedestrian and bicycle facilities.

Bus Transit

The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to bus transit.

Rail Operations

The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to rail operations.

Park-and-Ride Lots

The 2006 FEIS and 2007 ROD documented the commitment to locate two park-and-ride lots within the SR 167 Project's acquired right-of-way. During the scoping of SR 167 Completion Project's Phase 1 Improvements it was decided in consultation with local agencies and transit authorities, to not include these lots in Phase 1, due to limited funding and the preferred priorities of the stakeholders. However, this does not mean that park-and-ride lots are necessarily precluded from further consideration later. A second site that had been selected for a park-and-ride lot near the SR 161 interchange has since developed into a car dealership. A potential future phase(s) of this project could include further discussions with both Sound Transit and Pierce Transit with regards to the need for park-and-ride facilities in the corridor. The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to park-and-ride lots.

Commute Trip Reduction

The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to commute trip reduction programs.

Travel Demand Management

Since the 2006 FEIS, substantial changes have been made to the planned system and demand management within the SR 167 Completion Project Phase 1 Improvements corridor. Originally the facility was not planned as a tolled facility, but is now anticipated to have all-lane electronic toll points, pending toll authorization from the Washington State Legislature. This is anticipated to reduce travel times, and improve level of service in the corridor, as well as provide contributing revenue for construction, maintenance and operation of project facilities and infrastructure. The SR 167 Completion Project's Phase 1 Improvements will not result in any new significant impacts related to Travel Demand Management.

Coordinated Transit, Human Services and Special Needs

In 2007 the PSRC adopted the 2007 Regional Coordinated Transit-Human Services Transportation Plan, which was previously not applicable and therefore was not included in the 2006 FEIS. The current assessment of the proposed SR 167 Project's Phase 1 Improvements found no negative impacts on local transportation authorities, the services they provide, or the delivery and achievement of their coordinated transit, human services and special needs goals.

In summary, by providing new or improved bicyclist and pedestrian facilities, and by reducing the amount of traffic on local arterials, the SR 167 Completion Project Phase 1 Improvements would provide improvements for active transportation use. With respect to transit, the new roadway facilities would offer new connections for transit agencies to use, as well as improved access to future Link Light Rail in Fife via demand managed facilities. The relevant specific changes of the Phase 1 Improvements from the project proposed in the 2006 FEIS include:

- Preclusion of bicyclist use of the SR 167 mainline between 20th Street E and SR 161
- Conversion of the SR 167 Completion Project corridor to a tolled facility
- Not constructing two park-and-ride lots within the project area

Effects during Construction

The temporary construction effects described in Section 3.14.4 and Section 3.15.3 of the 2006 FEIS remain generally applicable to the Phase 1 Improvements, however on a smaller scale due to the alterations that has been made to the planned project.

Pedestrian and Bicycle Facilities

The reconstruction of 70th Avenue E in the 2006 FEIS was expected to impact users of the Interurban Trail, as two roundabouts were to be completed. These roundabouts are no longer planned to be constructed, minimizing the duration and extent of construction impacts in the area. Similarly, the construction of the SR 509/SR 167 pedestrian and bicycle features included with the Phase 1 Improvements would still affect users temporarily, though to a lesser extent due to the alterations made to the project. WSDOT would continue to provide reasonable accommodation for users, including detours on surrounding local streets. There are no changes in the temporary construction effects resulting from the relocation of Hylebos Creek, and it may still result in temporary closure of the Interurban Trail, during construction, depending on the final design of the relocated creek and the trail.

Transportation Resources

The 2006 FEIS did not specifically discuss any impacts on transportation-related resources during construction. Some disruption may occur from temporary street closures, and detours would be made available on alternative surface streets. It is the intent of WSDOT to complete work on primary segments

and nodes during night-time periods of low traffic volumes. Construction activities would, as in the 2006 FEIS, be coordinated with relevant authorities, including commuter rail and bus service authorities.

In summary, the temporary construction effects from this project would be comparable to or less than those identified in the 2006 FEIS for pedestrian and bicycle facilities, as well as for transportation-related resources. There are no new significant impacts from temporary construction effects of the project under the proposed Phase 1 Improvements.

Mitigation

Consistent with the documentation in the 2006 FEIS for pedestrian and bicycle facilities and transportation resources related impacts associated with operation, the Phase 1 Improvements would also require mitigation. These are not substantially different from what was covered in the 2006 FEIS, as limited changes have occurred since its publication. FHWA and WSDOT policies accommodate active transportation modes in the study area using best practice design. The general project mitigation measures regarding bicycles and pedestrians, as described in the 2006 FEIS would also be implemented for the Phase 1 Improvements. These are listed in Exhibit 4.16-7, which have been updated to reflect current policy and design guidance. The introduction of TDM with tolls, and several other CTR programs will provide substantial benefits to users and to the region which is an important improvement beyond what was described in the 2006 FEIS. It is determined that the previously identified mitigation measures will adequately address the impacts of the SR 167 Completion Project Phase 1 Improvements.

Exhibit 4.16-7. General Project Mitigation Measures

Mitigation Measures
Local roadways within the right-of-way of the SR 167 interchanges will be designed to the local jurisdiction's design standards and often will include bicyclist facilities and sidewalks for bicyclists and pedestrians.
All bicyclist and pedestrian facilities modified by the project would meet or exceed Americans with Disability Act (ADA) design standards.
SR 167 mainline shoulders will be designed to a maximum of 10 feet.
Local roadways and ramp intersections will be signalized to include pedestrian crosswalks, and activated signal systems, and bicyclist crossing improvements. At a minimum consider safety performance needs, projected bicycle volume, motor vehicle volume, traffic delay, roadway grade and the types of bicyclists using the intersection that may require more time to clear the intersection. Consider the installation of effective loop detectors or other methods of detecting a bicycle within the bike lane (in advance of the intersection) and turn lanes.
Work zone traffic control plans will consider nonmotorized route continuity needs including public notification and provisions for safe detour routes wherever reasonable. Any detour route for nonmotorized traffic indicated on the Traffic Control Plans will be physically reviewed. The existing surfaces within the project limits will be repaired, if necessary, to accommodate the special needs of nonmotorists.
Local comprehensive plans will again be reviewed prior to completion of contract plans for construction. This effort will address nonmotorized route continuity and network connectivity both at the local level and within the project, consistency with plans, and local jurisdiction coordination. Any such local plans affected by the project and determined to have been completed, progressed to design or construction phase will be evaluated and appropriate measures taken to address impacts.

Specific mitigation measures identified in the 2006 FEIS are also relevant to the Phase 1 Improvements. These measures are listed in Exhibit 4.16-8.

Exhibit 4.16-8. Summary of Specific Mitigation Measures

Mitigation Measures
At each segment or intersection, specific mitigations are recommended to accommodate nonmotorized travel.
The SR 167 Completion Project Phase 1 Improvements includes riparian restoration that will impact the westerly segment of the Interurban Trail. The trail alignment will be re-established outside of the Hylebos Creek and riparian restoration zone, as part of efforts to avoid and minimize impacts on recreation resources.
Roadway shoulder improvements will be made to SR 99 at the shared use path terminus north to 70th Avenue E. Shoulder width will be widened to not less than 5 feet and sidewalks, curb and gutters will be considered to control motorized access and provide for safe pedestrian travel on this regionally recognized bike route. The south path terminus beneath the SR 167 overhead structures at SR 99 will require a crossing treatment.
FHWA and WSDOT will also work closely with the City of Fife to address impacts on the Lower Hylebos Nature Park, potentially including access and parking.

Conclusion

No new significant impacts related to pedestrian and bicycle facilities and transportation-related resources from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. Mitigation measures would include detours, timely information, implementation of best practice travel demand management, rerouting and establishment of connections to existing bicycle infrastructure, and improvements to travel times and level of service for both transit, roadway users, active transportation users and coordinated transit. Due to the absence of impacts from the proposed Phase 1 Improvements on the affected environment in the study area, no additional mitigating measures are needed for the SR 167 Completion Project beyond what was documented in the 2006 FEIS. WSDOT and FHWA, in coordination with other involved transportation authorities, would continue to follow best practices during both construction and operation of the proposed facilities, as well as in addressing any concerns or comments regarding the impacts of the project from the public or local jurisdictions as design progresses, and during project construction and operation. See also Attachment P, Pedestrian and Bicycle Facilities, and Transportation Resources Technical Memorandum.

4.17 Cultural Resources

Affected Environment

The 2006 FEIS cultural resources documentation remains applicable to the SR 167 Project's proposed Phase 1 Improvements.

Numerous SR 167 Completion Project Phase 1 Improvements cultural resources studies have been undertaken since 2000. Reports presenting results of these studies are: Luttrell 2001 (revised 2005), 2002a, 2002b, 2004; Luttrell et al. 2004; Yamamoto et al. 2015, and Wilson, et al 2017.

The 2006 FEIS cultural resources affected environment consisted of an archaeological site (45PI488), five historic properties determined eligible for listing in the National Register of Historic Places (NRHP), one resource (in parcels 235 and 236) identified by the Puyallup Tribe of Indians as potentially containing archaeological resources, and the Washington Heritage Register (WHR) eligible Carson Chestnut Tree.

The Phase 1 Improvements Area of Potential Effects (APE) has been defined as the proposed right-of-way (ROW) and one tax parcel on either side of the ROW where indirect effects may occur. Potential effects to archaeological sites are primarily anticipated where ground disturbance would occur during project construction. Historic structures may be directly affected by the above described construction activities and may be indirectly affected by noise, vibration, or changes to the visual environment associated with the construction and implemented use of the proposed project.

The original alignment for the project as documented in the 2006 FEIS was investigated through archaeological survey, built environment survey, and limited archaeological testing in 2000-2004 (Luttrell 2001-revised 2005, 2002a, 2002b, 2004; Luttrell et al. 2004). In 2015, additional field survey and shovel testing for archaeological resources was undertaken within a Refined Alignment (RA) ROW developed in 2008 (Yamamoto et al. 2015). At that time, portions of the RA ROW that were not part of the FEIS alignment ROW were investigated, to ensure all historic and archaeological resources potentially affected by the Phase 1 Improvements were surveyed and studied. Portions of the project APE outside of the direct impact archaeological survey area were surveyed in 2015 for those built environment buildings/structures that were not addressed during investigations supporting the 2006 FEIS, or that had reached the 45 year threshold in the interim.

Not all previously uninvestigated areas of the RA ROW could be surveyed for cultural resources in 2015 due to lack of right-of-entry for some parcels and, in portions of other parcels, standing water, planted crops, etc. (Yamamoto et al. 2015). The 2015 report identified those pedestrian survey/shovel test areas that could not be accessed (Yamamoto et al. 2015).

In 2017, additional cultural resources survey was undertaken in some Phase 1 project APE parcels that could not be accessed previously. The 2017 survey and shovel testing identified no cultural resources. No buildings/structures in the 2017 surveyed area crossed the 45-year-old threshold since the 2015 investigations, and no additional structures were recorded in 2017.

PREVIOUSLY RECORDED CULTURAL RESOURCES

Ten previously recorded cultural resources determined eligible to either the NRHP or the Washington Heritage Register of Historic Places (WHR) have been documented in the project APE (Exhibit 4.17-1). Extant residences are identified on maps in this report by their 2015 field numbers (Yamamoto et al. 2015). The locations of extant resources are shown on Figure 1 of the "Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington" (Short Report DOT17-03 - December 2017,

prepared for WSDOT by Archaeological and Historical Services, Eastern Washington University). This document is included in Attachment Q, Cultural Resources Investigations and Section 106 Concurrence.

Exhibit 4.17-1. Eligible Properties in the SR 167 Completion Project (Phase 1 Improvements) APE

Property	Eligibility	Comment	In Phase 1 ROW
Site 45PI488	NRHP	Archaeological	Yes
Carson Chestnut Tree	WHR	Tree	Yes
6803 20th Street E	NRHP	Demolished	N/A
7001 20th Street E	NRHP	Demolished	N/A
7717 Valley Avenue E	NRHP	Demolished	N/A
6020 8th Street E	NRHP	Field No. 11	Yes
4403 Freeman Road E	NRHP	Field No. 22	Yes
6007 Milwaukee Avenue E	NRHP	Field No. 37	Yes
620 Milwaukee Avenue E	NRHP	Field No. 40	No
860 64th Avenue	NRHP	Field No. 42	No

Site 45PI488 was determined eligible for listing in the NRHP in 2003. The FHWA determined, and the Washington Department of Archaeology and Historic Preservation (DAHP) concurred, that the SR 167 Completion Project Phase 1 Improvements would not have an adverse effect on the site if it is spanned with a bridge constructed outside the known site boundaries and if cultural resources monitoring in the vicinity is implemented during construction activities (FHWA 2006:H-10, 2007:59). The WSDOT's obligations remain unchanged and the Phase 1 design would avoid impacting the prehistoric site pursuant to DAHP's concurrence and FHWA ROD commitment (FHWA 2007).

The SR 167 Extension Project implemented Carson Chestnut Tree protection in all design options in the SR 161/SR 167 interchange vicinity (FHWA 2007:24). "No effect on the Carson Chestnut Tree is expected because FHWA and WSDOT have committed to avoiding the tree and avoiding construction activities that might damage the tree" (FHWA 2007:25). The Phase 1 design would avoid impacting the Carson Chestnut Tree and WSDOT's obligations pursuant to the FHWA ROD commitment remain unchanged.

Three NRHP-eligible Fife residences within the Phase 1 ROW identified in the 2006 FEIS (6803 20th Street E, 7001 20th Street E, and 7717 Valley Avenue E) have subsequently demolished by WSDOT. The remaining five residences listed in Exhibit 4.17-2 were the only properties of the 65 recorded in 2015 (Yamamoto et al. 2015) in the project APE determined eligible for listing in the NRHP.

Two parcels in the project APE, one partially within the Phase 1 ROW (in Figure 1, referenced above) and one immediately adjacent, are reported by the Puyallup Tribe to potentially contain archaeological resources. The remote sensing study conducted at this location in 2004 did not confirm or rule out burials at this location. The location would be avoided and the Puyallup Tribe notified should any ground disturbing activity be planned in that vicinity (FHWA 2007:24).

Effects during Operation

The six existing NRHP-eligible historic properties identified in the SR 167 Extension Project APE during previous cultural resources investigations (Luttrell 2001-revised 2005, 2002a, 2002b, 2004; Luttrell et al. 2004; Yamamoto et al. 2015) are listed in Exhibit 4.17-2; of the six, four are within the Phase 1 ROW.

Exhibit 4.17-2. NRHP-Eligible Resources within the SR 167 Completion Project (Phase 1 Improvements) APE

NRHP Eligible Resource	Field No.	Figures	Within Phase I ROW
Site 45PI488	Archaeological	1 & 3	Yes
6020 8th Street E	11	1 & 3	Yes
4403 Freeman Road E	22	1 & 4	Yes
6007 Milwaukee Avenue E	37	1 & 5	Yes
6020 Milwaukee Avenue E	40	1 & 5	No
860 64th Avenue	42	1 & 3	No

Site 45PI488 would be avoided and Phase 1 design would avoid impacts on the resource (FHWA 2006:H-10, 2007:59). If planned Phase 1 ROW construction activities include impacts on any of the three residences within the Phase 1 ROW listed in Exhibit 4.17-2, Level II documentation would be necessary mitigation.

Other Resources within the Phase 1 ROW

The Carson Chestnut Tree, east of SR 161 within the Phase 1 ROW is eligible for listing in the WHR. The Phase 1 design would avoid impacting this resource and WSDOT's commitment to protection of the tree is unchanged (FHWA 2007:25).

The potential burial location partially within the Phase 1 ROW, would be avoided and the Puyallup Tribe notified should any ground disturbing activity be planned in the vicinity (FHWA 2007:24).

Effects during Construction

There would be no Phase 1 temporary construction effects if required mitigation measures are followed. In the unlikely event that unanticipated cultural resources are identified during construction or other project-related activities, work should be halted in the immediate vicinity of the find and a professional archaeologist notified to assess the resource.

Mitigation

Mitigating measures in Section 3.16.7 of the 2006 FEIS remain applicable for the historic properties and the potential burial area within the Phase 1 area. Phase 1 Improvements mitigation measures are reduced compared to those for the 2006 FEIS Build Alternative, because there are four Phase 1 cultural resources as opposed to eight identified in the 2006 FEIS Build Alternative cultural resources documentation.

In August 2018, WSDOT, FHWA, the USACE, and the SHPO signed an Amended Section 106 MOA. The MOA specifies required mitigation to address the impacts of proposed Phase 1 Improvements. The document is included with Attachment Q, Cultural Resources Investigations and Section 106 Concurrence.

Conclusion

The Phase 1 Improvements project affected environment is smaller than the 2006 FEIS affected environment as fewer cultural resources are present in the Phase 1 Improvements affected environment. With adherence to the regulatory requirements, no new significant impacts on cultural resources from construction and operation not previously identified in the 2006 FEIS, or signed Amended Section 106 MOA, would occur due to the Phase 1 Improvements.

Documentation completed for the NEPA re-evaluation of the SR 167 Extension Project Phase 1 ROW, along with the additional cultural resource investigations referenced above and the Amended Section 106 MOA, is sufficient to support a finding that the 2006 FEIS cultural resources determination is not substantially different than that for the Phase 1 ROW regarding cultural resources.

See also Attachment Q, Cultural Resources Investigations and Section 106 Concurrence.

The Section 4(f) Evaluation (Attachment S) provides additional information on historic and cultural resources.

4.18 Indirect and Cumulative Effects

Methods

For this Re-evaluation, WSDOT reviewed the 2006 FEIS and supporting documentation, as well as the updates to each of the discipline studies prepared for the NEPA Re-evaluation of the Phase 1 Improvements. WSDOT reexamined the FEIS sections on indirect and cumulative effects (3.1.2; 3.17), including the Net Environmental Benefits Analysis (3.17-2), and the section on "activities contributing to cumulative effects" (3.0).

To update the indirect effects, WSDOT considered interactions between the project's effects to identify ways in which the project contributed to effects further removed in time or place.

In identifying and analyzing potential cumulative impacts WSDOT used Joint Guidance issued by WSDOT, FHWA Washington Division, and the U.S. Environmental Protection Agency Region 10, entitled: Guidance on Preparing Cumulative Impact Analyses (2008).

WSDOT relied on the information in the discipline-specific studies and the regional and local studies referenced in the Land Use and Socioeconomics technical memorandum. WSDOT considered whether there was any new potential for cumulative impacts on all resource areas analyzed in the Re-evaluation. Consistent with the Joint Guidance, the analysis of cumulative effects focused on the resource areas where potential direct and indirect effects were identified. If there are no project related impacts or temporary effects are fully mitigated, then these actions are not likely to contribute to a cumulative effect on a particular resource.

In the FEIS (page 3-9), the following resources were evaluated for cumulative impacts:

- Water Resources
- Wetlands
- Wildlife, Fisheries and Threatened and Endangered Species
- Land Use, Socioeconomic Impacts, and Environmental Justice
- Farmland
- Cultural Resources

This Re-evaluation evaluates the other resources where the project has either positive or negative direct or indirect effects. This analysis also required an update to reasonably foreseeable future projects. WSDOT updated the status of the future projects discussed in the 2006 FEIS by reaching out to the Port of Tacoma, Puyallup Tribe, and local governments in the SR 167 Completion Project Phase 1 Improvements area. WSDOT also accessed the Washington State Department of Ecology's "SEPA Register" as recommended by the 2008 joint guidance.

WSDOT compiled information from two SEPA Register searches via Ecology's website: https://fortress.wa.gov/ecy/separ/Main/SEPA/Search.aspx.

The first search documented projects filed between 1/1/2010 and 12/15/2015 for the Cities of Milton, Edgewood, Fife, Federal Way, Puyallup, and Tacoma. Projects filed for Pierce County were also reviewed if they were within a mile of the project area. The second search of the similar areas was conducted in June 2018, and downloaded projects for January 2016 to June 6, 2018. Using similar methods, the list of projects was then sorted and mapped to determine which of those projects would be located within the study area. Those projects within a 1-mile buffer were then included as "reasonably foreseeable future

projects" for the purposes of this cumulative effects Analysis. The results of these searches are documented below.

Affected Environment

As noted in the 2006 FEIS, activities occurring within the study area that are likely to contribute to cumulative impacts include additional state and local road projects, continued commercial and industrial development, the planned expansion of the Port of Tacoma, and development associated with local public facilities such as sports parks, pedestrian trails, and schools.

Substantial land use changes and highway improvements since 2006 are described below. In addition, data gathered from the SEPA Register since the completion of the FEIS is provided to further illustrate development trends in and around the SR 167 Completion Project Phase 1 Improvements area.

Development Trends

The trends reported in the 2006 FEIS are still accurate, and include:

- Expansion of shipping operations at the Port of Tacoma. To accommodate anticipated increase in container volumes, the Port plans to expand existing terminals and develop terminals for new clients. Simultaneous with terminal expansion the Port plans waterway, rail, and road infrastructure improvements. (Personal communication from Port of Tacoma's Christine Wolf to Steve Fuchs on 7/24/18).
- As projected in the 2006 FEIS, industrial/manufacturing and commercial development of vacant, buildable parcels in Fife, Milton, and Puyallup valley area has occurred at a fast pace.
    - For example, the full build out along Freeman Road SE between Valley Avenue on the south and 20th Avenue E on the north has been completed. This (development) continues to involve conversion of agricultural and open space within the urban areas of Fife, Milton, and Puyallup to industrial, commercial, and residential uses, such as the proposed CMC Heartland development of 850 homes and condominiums, a 150-bed assisted-living facility in Fife. (Personal communication from Steve Friddle, City of Fife Development Director to Steve Fuchs on 8/27/18).
    - The FEIS anticipated development in the City of Milton at the Lloyds, Inc. Recent status from the city is that the development is on hold. The city has been working with the owners of the Lloyds property for several years in an effort to facilitate sale of the property for commercial use. There have been, to date, at least two separate proposals from development companies. Both of these proposals involved the construction of warehouses (Personal communication from Mark Howlett to Steve Fuchs on 7/24/18).
    - Development of Puyallup Tribal properties in the Port of Tacoma and the Fife/Puyallup valley. The tribe has been working on the construction of a new Emerald Queen Casino and parking garage near Portland Avenue in Tacoma.
    - Development of Pacific National Soccer Park. This initiative by the City of Fife fell through and WSDOT purchased the property for the SR 167 Completion project.

Transportation Projects Update

Planned transportation system improvements in the vicinity of the proposed SR 167 Completion Project as identified in the Pierce County Six Year Improvement Program (Pierce County 2000) are:

- Widening and reconstructing Canyon Road to extend north from Pioneer Way to connect with 70th Avenue E. This roadway would link the planned Port of Tacoma employment center in Frederickson with the Port of Tacoma and northward. This project continues to move forward

with environmental documentation and ROW acquisition. Construction funding has not yet been secured.

- Widening and reconstructing Valley Avenue from Freeman Road E to 20th Street E. This project is complete.

Planned transportation system improvements in the vicinity of the proposed SR 167 Completion Project as identified in the WSDOT Highway System Plan (WSDOT 1998) and Destination 2030 (PSRC 2001) are:

- Improving the connections between SR 18, I-5, and SR 161 ("Triangle Project"). Phase 1 is complete, Phase 2A and some of Phase 2B is funded by the 2015 Connection Washington revenue package.
- Widening SR 161 from 36th Street to I-5. The project that widened SR 161 from 36th Street to Jovita Blvd is complete. WSDOT is unsure if there are future plans for any more widening from Jovita to I-5.
- Constructing Core HOV lanes along I-5 from Seattle to SR 512. This work is progressing. Three projects are nearing completion by 2019 and the final project (southbound Puyallup River Bridge) would begin in early 2019 with completion expected by 2022, at which time HOV lanes would be continuous from SR 16 in Tacoma to Seattle.
- Constructing Core HOV lanes along SR 167 from Puyallup to Seattle. High-Occupancy Toll (HOT) lanes have been constructed from I-405 to near 8th Street in Pacific along southbound SR 167. Also, the HOV direct-connect ramps at the SR 167/I-405 interchange is currently under construction and expected to be complete by mid-2019. The HOT lane for northbound SR 167 construction is complete from SR 18 to I-405. A project is now funded that would build an HOV lane from SR 410 to connect with the HOT lane at SR 18 with construction beginning in 2019.
- Widening SR 16 from the Tacoma Narrows Bridge to I-5, to include SR 16/I-5 interchange improvements. The widening of SR 16 is complete and the I-5/SR 16 interchange is under construction and expected to be complete in 2020.
- Transit Improvements, for example Sound Transit's commuter rail to Lakewood is complete.

Comprehensive Plans

As noted in the Land Use and Socioeconomics technical memorandum, all of the local jurisdictions have recently updated their comprehensive plans, zoning maps, and related regulations in compliance with the Growth Management Act (RCW 36.70A) as part of the required eight-year GMA update process. Based on the review of the local comprehensive plans and related regulations, there has been no change in land use plans that would cause the proposed SR 167 Phase 1 Improvements alignment to be incompatible with adjacent land uses or inconsistent with adopted plans.

Exhibit 4.18-1 lists the reasonably foreseeable future projects from a SEPA Register search conducted in December 2015. There are four projects (shown in bold text) in the SR 167 Completion Project Phase 1 Improvements area. Adjacent to the project area, there are several more proposed developments. These findings are consistent with the development trends identified in the 2006 FEIS as occurring with or without the project.

Exhibit 4.18-1. SEPA Register Results

Residential Development	Jurisdiction
Cruz short plat – divide 1.48 acres into two single-family building lots and wetland buffer area at 407 Comet Street.	Milton
Commercial Development	**Jurisdiction**
Tacoma RV -- construct new RV display parking lot and landscaping at 6224 16th Street E.	Fife
Hogan and Bigelow -- expand existing RV sales lot at 5312 Pacific Highway E.	Fife
Ram Brewery -- construct 12, 044 sq. ft. extension to existing brewery to include a tasting room and office space at 7326, 26th Street E.	Fife
Marine View Ventures -- construct gas station and 12,225 sq. ft. grocery and convenience store at the SW corner of SR 99 and 62nd Avenue E.	Fife
Johnny's at Fife – demolish existing gas station to allow expansion of restaurant parking lot by adding 36 spaces at 5217, 20th Street E.	Fife
Car Max LLC – construct a used car dealership on 18.3 acres with an 85,000 sq. ft. building and 20 parking stalls at 800 Valley Avenue NW.	Puyallup
Northwest Motorsports – construct a new 7,700 sq. ft. building for a used car dealership on an existing paved commercial site at 400 Valley Avenue NE.	Puyallup
Verizon Wireless – install a new wireless communication facility mounted on an existing light pole at the Puyallup Recreation Center above the sports field lights at 810 Valley avenue NW.	Puyallup
Industrial Development	**Jurisdiction**
Benaroya Capital Company LLC -- construct 7 warehouses and 3 retail buildings at Freeman Rd and 20th.	Fife
Biogenic Reagents LLC - construct a biomass carbonization processing plant at 5111, 4th Street E.	Fife
Panattoni Development Co. -- construct 171,620 sq. ft. industrial building on 8.98 acres with 110 parking stalls and 44 High Dock loading doors, frontage improvements and landscaping at 7012 20 Street E.	Fife
Todd Road Distribution Facility – construct 2 office/warehouse buildings (43,917 sq. ft. and 56,840 sq. ft.) and 113 parking stalls at 208 Todd Road NE.	Puyallup
Port 167 Industrial Park (Tarragon) – Construct a 652,227 sq. ft. warehouse/distribution park on a 33.6 acre site with asphalt parking, maneuvering areas, landscaping and storm drainage at the 1300 block of Valley Avenue E.	Puyallup
Delacey – construct 113,000 sq. ft. warehouse with parking, landscaping, water, sewer and stormwater facility on an undeveloped 6.56 acres site on the south side of Valley Avenue.	Puyallup
Duris – construct 196,785 sq. ft. industrial warehouse, 158,231 sq. ft. parking lot, 54,981 sq. ft. storm pond with associated patio, walkway and landscaping, at 4410 86th Avenue, Puyallup	Pierce County

Years: 2010–2015

Bold text identifies reasonably foreseeable future projects that are within the SR 167 Completion Project Phase 1 Improvements area.

Source: SEPA Register listings for Pierce County and the cities of Edgewood, Milton, Fife, Tacoma, Puyallup and Federal Way filed between 1/1/2010 and 12/15/2015. SEPA Register website visited 12/23/2015.

In order to update the SEPA findings, a second SEPA Register search was conducted in June 2018. The information search was for the years 2016, 2017 and 2018. The comprehensive list of SEPA documents was then sorted and mapped to determine which potential future projects would be located within the SR 167 Completion Project Phase 1 Improvements study area. Exhibit 4.18-2 below shows those projects within a 1-mile buffer.

Those projects within a 1-mile buffer were then included as RFFAs for the purposes of the Cumulative Effects Analysis.

Exhibit 4.18-2. Recent SEPA Register Search Results

MAP ID	SEPA Number	Issued Date	City	Proposal	Type of Development
1	201603994	7/20/2016	Fife	Fife Auto Mall Expansion; Phase 1- Construct a landscaped, paved and lighted parking lot for new and used cars, employee parking, service vehicle parking and unloading area for vehicle transport trucks on parcel #s 0320013125 & 0320122050. Approximately 423 parking spaces on 4.17 acres. Phase 2 - Construct addition of about 6,192 square feet of Lexus service shop which would include 9 service bays plus space for new car delivery to customers on parcel #0320017013. Some interior remodeling of sales and customer areas would also be completed. Phase 3 - A new 7,875 square foot service shop would be constructed on the Volvo Site (parcel # 0320126019). This would have about 10 service stalls, support space for tools and parts, plus toilets and a break room for staff.	Commercial
2	201602232	5/4/2016	Tacoma	Prologis Park Tacoma; The proposal consists of the construction of up to four office/warehouse buildings totaling approximately 1,746,350 square feet and associated utilities, parking, driveways, and landscaping on an approximate 80.7-acre site. Extension and construction of utilities onsite and offsite includes water (domestic, fire, storm), sanitary sewer, power, natural gas, and other franchise utilities.	Office/ware-house buildings
3	201801205	3/9/2018	Fife	Fife Truck Shop; Construct a two story semi-truck repair shop with 3,894 square feet on the first floor and 1,080 square feet of office space on the second floor. Exterior canopy would cover an additional 924 square feet.	Industrial/ office

Exhibit 4.18-2. Recent SEPA Register Search Results

MAP ID	SEPA Number	Issued Date	City	Proposal	Type of Development
4	201801284	3/14/2018	Fife	Fife Mixed Use Development; Develop a mixed use building with commercial and residential spaces totaling approximately 37,300 s.f. with a 10,180 s.f. footprint. Commercial area would be approximately 1,904 s.f. split between two suites. 34 residential units are proposed on the remainder of the first floor and floors 2-4. Other improvements include water, sewer, storm and frontage as required by code.	Mixed use development
5	201802035	4/19/2018	Fife	Davis Development - 70th Warehouse and Grocer; Construct an ~14,200 sq. ft. retail grocery store with an option to construct an additional 6,000 sq. ft. storage area dependent on future tenant use and an ~55,000 sq. ft. associated warehouse. Along with building construction the proposed development would also include grading activities, landscaping buffer, paved parking and truck maneuvering areas, stormwater facility, water and sanitary sewer connections and franchise utility improvements. A three lot short plat and a Development Agreement with the City of Fife would also be processed as part of the proposed development. The site was previously graded and filled under separate permits issued by the City of Fife.	Retail grocery store and warehouse
6	201606386	11/28/2016	Fife	Lakeridge Industrial Development; Construct a 36,090 square foot industrial building with related site improvements.	Industrial building
7	201705513	10/18/2017	Edgewood	Edgewood View Estates; Subdivide three existing parcels, totaling 39.24 acres to create 92 single-family residential lots within the City of Edgewood. Project includes construction of required improvements for roadways, utilities, and landscaping.	92 single-family lots

Exhibit 4.18-2. Recent SEPA Register Search Results

MAP ID	SEPA Number	Issued Date	City	Proposal	Type of Development
8	201801100	3/5/2018	Puyallup	Valley Avenue Business Park; Construct new 44,090 SF business park building with associated parking and landscaping on a 3.17 acre site. Office space would occupy 9,000 SF & warehouse would occupy remaining 35,090 SF.	Business park building
9	201606312	11/21/2016	Puyallup	Olympic Eagle Distributing; Preliminary Site Plan and land use variance application proposing an expansion (approximately 32,400 square feet) of an existing distribution warehouse. Additional off-street parking is proposed as well. Applicant proposes a variance to reduce/eliminate perimeter landscaping in order to allow off-street truck parking.	Distribution warehouse
10	201606674	12/14/2016	Puyallup	Nautica Business Center; Preliminary site plan review request for construction of two warehouse buildings for high cube storage at 235 & 325 Todd Road NW, Puyallup WA. Building 1 would be 77,850 sf & building 2 would be 50,000 sf. Each would have dock high doors and parking for deliveries.	Two warehouse buildings

Date: 2016 – Current

Source: SEPA register website: https://fortress.wa.gov/ecy/separ/Main/SEPA/Search.aspx visited on June 6, 1018.

Effects during Operation

Indirect Effects

WSDOT examined indirect effects as part of the assessment of direct effects on each resource. The 2006 FEIS identified few indirect effects. This 2018 analysis did not uncover any new indirect effects. The findings are consistent with the 2006 documentation.

The Phase 1 Improvements are anticipated to have the same indirect effects as were associated with the 2006 Build Alternative: By substantially improving travel and accessibility, the SR 167 Completion Project Phase 1 Improvements may accelerate short-term planned development in the vicinity of the new freeway interchanges. The Phase 1 Improvements may have fewer indirect impacts associated with nearby development because they are proposed as a fully tolled facility, based on Legislative intent, and elements like the park-and-ride lots are not included.

The FEIS disclosed how the mitigation tied to the project, especially the RRP, contributes to a beneficial indirect effect on wetlands and water resources in the project area when compared to the No Build alternative (FEIS pages 3-108-110). With regard to Wildlife, Fish, and Threatened and Endangered

Species, the updated analysis for the Phase 1 Improvements confirms the FEIS conclusion of fewer indirect effects from the Build Alternative (FEIS pages 3-178), due to the RRP's creek realignment and restoration which would not otherwise occur.

Finally, as noted in the updated Environmental Justice discipline report, WSDOT did not identify any indirect impacts of the Phase 1 Improvements to environmental justice populations.

Cumulative Effects

The analysis conducted reached similar conclusions as documented in the 2006 FEIS Table 3.17-1: Anticipated Cumulative Impacts Compared (page 3-408 of the FEIS), included as Exhibit 4.18-3 below.

Exhibit 4.18-3. 2006 FEIS Anticipated Cumulative Impacts Compared

Resource (critical resources are shaded)	Build Alternative	No Build – other planned development	Impacts as result of planned growth
Water Resources	Impacts	Impacts	Yes
Wetlands	Impacts	Impacts	Yes
Wildlife, Fish and T&E Species	Impacts	Impacts	Yes
Air	No change	No change	Yes
Noise	Impacts	Impacts	Yes
Energy	Improvements	Impacts	Yes
Hazardous Materials	Improvements	Improvements	Yes
Visual Quality	Impacts	Impacts	Yes
Public Services & Utilities	No change	Impacts	Yes
Land Use	Impacts	Impacts	Yes
Socio-Economic	Improvements	Improvements	Yes
Farmland	Impacts	Impacts	Yes
Displacement, Disruption, and Relocation	Impacts	Impacts	Yes
Transportation	Improvements	Improvements	Yes
Pedestrian and Bike Facilities	Improvements	Impacts	Yes
Cultural Resources	Impacts	Impacts	Yes

No change = No change from baseline; Impacts = anticipated negative cumulative impacts on the resource; Improvements = anticipated positive cumulative impacts on the resource.

The 2006 FEIS described cumulative effects on critical resources, those resources that may experience substantial cumulative change (page 3-407). The FEIS did not evaluate cumulative effects for those resources that were either positively impacted, or unlikely to be impacted by the 2006 Build Alternative. For the analysis of the proposed SR 167 Phase 1 Improvements conducted for this memorandum, the WSDOT and FHWA's Joint Guidance (2008) was followed, which recommends cumulative effects be considered for any resource that is directly affected by the current project (whether positively or negatively). This memorandum also discusses an analysis of climate change, consistent with WSDOT's Environmental Manual and current environmental documentation procedures.

Water Resources

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to cumulative effects on water resources (page 3-84). The FEIS also explained how the RRP would be

expected to provide direct and indirect improvements to stream and wetland functions. This analysis updates the assessment of Phase 1 Improvements impacts and benefits. The findings are consistent with those in the FEIS. Trends for surface and ground water quality remain the same given the development pattern in the study area and adherence to stormwater requirements.

The findings in the updated discipline study are consistent with the FEIS; however the smaller footprint of the proposed Phase 1 Improvements reduces the effects (Attachment C, Water Resources Technical Memorandum). In addition, the project continues to include benefits provided by the RRP with regard to reduced floodplain impacts and increased long term resilience.

Wetlands

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to cumulative effects on wetlands. The FEIS (page 3-112) explains that the project's contribution is not substantial given the land use development trends in the basin irrespective of the project. The findings of the updated discipline study are consistent with the FEIS. The Phase 1 Improvements result in fewer direct impacts on wetlands (2018 "Wetlands" technical memo). The RRP proposed in Phase 1 Improvements provides similar benefits to what was evaluated in the FEIS. WSDOT anticipates the wetland and riparian function to improve in the immediate project area; however, there are still cumulative impacts. As noted in the FEIS, trends in mitigation ratios and other local protection efforts would help to lessen the amount of direct impacts on wetlands from the increased development in the project area.

Wildlife, Fish, Vegetation, and Threatened and Endangered Species

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to cumulative effects for Wildlife, Fish, Vegetation, and Threatened and Endangered Species. The most notable effects include increases in summer stream temperatures and toxicants, conversion of habitats, hastened buildout, further fragmentation, and a reduction in available mitigation and restoration areas (page 3-185 of the FEIS). The RRP would restore and protect a large area of riparian and wetland habitat and improve stream conditions; however, it is not expected to completely offset cumulative effects. Even with a smaller footprint, Phase 1 has similar findings to the 2006 FEIS.

Air Quality

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute cumulative effects on air quality. Construction impacts for the proposed Phase 1 Improvements are the same as documented in the 2006 FEIS. The construction of the project may cause minor temporary air quality disturbances from dust and construction-related emissions. The project incorporates measures to control temporary air quality issues during construction. Regarding operational impacts, concentrations of criteria pollutants would continue to be below NAAQS. The Phase 1 Improvements would have no meaningful effect on regional MSAT pollutant burden levels. The interagency Air Quality Consultation partners (EPA, FHWA, PSRC, PSCAA, FTA, and Ecology) determined the project is not one of air quality concern (Attachment F, Air Quality Technical Memorandum). The construction and operation of the project is not likely to contribute to cumulative effects on air quality.

Noise

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project did not assess the potential for cumulative noise impacts. This analysis and the updated noise discipline study show that noise levels are similar between the 2006 Build Alternative and proposed Phase 1 Improvements. Phase 1 has fewer sites impacted by noise, however none of these sites were determined both feasible and reasonable for mitigation via noise walls (Attachment G, Noise Technical Memorandum). Construction

noise would be mitigated as described in the Noise memo, consistent with the 2006 FEIS and 2007 ROD. The project in combination with current and future projects is likely to result in a slight contribution to the cumulative road noise in the area.

Energy and Greenhouse Gas

The 2006 FEIS did not discuss cumulative effects on energy, and at the time of publication, no Greenhouse Gas analysis was required. The updated analysis for the Phase 1 Improvements concludes that the smaller footprint would result in less energy use in construction compared to the 2006 Build Alternative, and operational energy use would be slightly less due to reduced congestion on local streets. Greenhouse gas analysis shows the Phase 1 project operation would have a negligible or slightly reduced contribution when compared to No Build, given future emissions are projected to decrease due to improved fuel standards and technology.

Hazardous Materials

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute to cumulative effects. The Phase 1 Improvements project is not expected to result in discharge of hazardous materials; however there are known pre-existing areas of contamination in the project area from past land uses. For this analysis, we note that hazardous materials are not themselves a resource that would be evaluated for cumulative effects. Hazardous materials can, however, enter the air and water and eventually affect human health and ecosystems. As noted in the Hazardous Materials technical memorandum, there are potential risks of encountering hazardous materials during the construction of the project, and safeguards would be in place to minimize temporary impacts, including development and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) for construction projects. In general, new development projects remediate past contamination and result in improved conditions. If any inadvertent discharges of hazardous materials occur, these would be contained, cleaned up, and adverse effects avoided.

Visual Quality

The 2006 FEIS did not discuss cumulative effects. The FEIS disclosed direct effects from the Build Alternative, including altered views, increased nighttime light and glare. The project area's visual landscape has become more urbanized without the project, as noted in both the FEIS and the updated "Visual Quality" technical memorandum. The technical memo states: "the viewshed is no longer flat because it is currently (as of 2018) dominated with large warehouse buildings, commercial and industrial complexes, and the increased industrial character have already created negative impacts to the shrinking agricultural viewshed."

While the overall effects are similar between the 2006 Build Alternative and the Phase 1 Improvements, the reduction from three levels to one level (Diverging Diamond Interchange) under the Phase 1 Improvements would lessen (reduce) the visual impact in the vicinity of I-5 as compared to the full Build Alternative. The direct impacts on visual quality would be mitigated through architectural elements and landscaping. The direct effects of the project combined with the increasing development in the area are likely to contribute a cumulative visual impact.

Public Services

The 2006 FEIS did not discuss cumulative effects on public services. The FEIS disclosed beneficial and adverse impacts on public services. During construction, delays were anticipated; after construction the transportation improvements would enhance services – giving service providers a new highway facility to use. The updated analysis of Public Services for the Phase 1 Improvements reached similar

conclusions. Overall, the project would contribute a minor positive cumulative effect by improving regional and local transportation.

Utilities

The 2006 FEIS did not discuss cumulative effects on utilities. The FEIS disclosed beneficial and adverse impacts on utilities, including improved stormwater facilities and upgraded sewer connections. The updated analysis conducted for the Phase 1 Improvements reached similar conclusions. Based on the proposed design for Phase 1, a net reduction in utility impacts is anticipated compared to the 2006 FEIS Build Alternative, including a reduction in impacts on overhead electric lines and towers, and reduced impact to the Olympic Pipeline of approximately 5,000 linear feet. Impacts for Phase 1 would be fully mitigated, and work would be closely coordinated with utility owner/operators. The Phase 1 Improvements are not likely to contribute to cumulative effect on utilities.

Land Use and Socioeconomics

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not create cumulative effects for land use and socioeconomics. The FEIS notes that the conversion of land uses to higher intensity uses is consistent with adopted land use plans and the project is not expected to have negative cumulative effect on movement within or between neighborhoods (FEIS page 3-295).

The Phase 1 Improvements would not affect land use or induce growth and development in the region. As noted in the updated "Land Use and Socioeconomics" technical memorandum under potential indirect effects, any future development or redevelopment would be consistent with land use plans and policies for that area. Consistent with the findings in the 2006 FEIS, the Phase 1 Improvements are not likely to contribute to a cumulative effect on land use.

Displacement, Disruption and Relocation

The 2006 FEIS did not discuss cumulative effects on displacements, disruption and relocation. These are not separate resources. These issues are generally included in the analysis of cumulative effects on Land Use, Socioeconomics and Environmental Justice, described elsewhere within this technical memo.

Farmland

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to an adverse cumulative effect on farmland (FEIS page 3-334). The FEIS documented the trend of land use conversion in the region, resulting from urban land use designation and economic pressures on farming in the area. Local zoning changes and economic pressures continue. This analysis confirms this finding. While the Phase 1 Improvements Project has a smaller footprint, it does involve unavoidable impacts on farmlands in general. The 2006 FEIS disclosed permanent conversion to transportation use (FEIS pages 3-330 to 3-332). There are no longer any parcels of land in the Phase 1 Improvements vicinity designated as "Farmland" pursuant to the federal Farmland Protection Policy Act (FPPA) definition. There would be permanent conversion of lands currently in "agricultural use" to a Transportation use. Since cumulative effects considers past, present and future actions, the findings of the 2006 remain similar today.

The mitigating measures described in the FEIS are still valid: WSDOT would work directly with farmers to minimize impacts and provide adequate notice of potential disruptions, and identify circulation options during construction to maintain access; impacts on leased farms would involve negotiation with tenant and land owner; and relocation assistance would be provided to all those who qualify.

Transportation

The SR 167 Completion Project Phase 1 Improvements directly benefits regional and local transportation. Consistent with the 2006 FEIS, with the proposed Phase 1 Improvements, there are

beneficial cumulative effects on transportation. Future planned transportation projects that could also affect traffic conditions in the SR 167 Completion Project Phase 1 Improvements area were considered for the cumulative effects analysis. The Phase 1 Improvements would contribute a positive cumulative effect on regional and local transportation.

Pedestrian and Bicycle Facilities, and Transportation Resources

The 2006 FEIS did not discuss cumulative effects on nonmotorized travel. The project area has experienced rapid growth, as noted in the land use sections of the FEIS and the updated discipline study of "Pedestrian and Bicycle Facilities, and Transportation Resources." Transit and pedestrian/bike facilities are improving throughout the region to address the needs of all users. The 2006 FEIS provided that SR 167 would be open to nonmotorized travel except for the section from the 54th Avenue E interchange in the vicinity of 20th Street. The 2006 FEIS also noted that as volumes increase, FHWA and WSDOT would periodically evaluate the safety of bicycles using the facility (Page 3-393). The Phase 1 Improvements include physical improvements that would benefit transit and other service providers, consistent with the FEIS. However, less of the facility would be open to nonmotorized travel because of safety concerns. A separate shared-use path would be constructed between 8th Street E to SR 99, to allow connection of bicyclists and pedestrians from the existing City of Fife Hylebos / Milgard Nature Area trail system to the east side of I-5. A new 70th Avenue structure over I-5 would provide connection for the active transportation community. The project, in combination with improvements on the local system would provide some improvements for pedestrian and bicycle facilities. The Phase 1 Improvements are not likely to contribute to cumulative effects on nonmotorized travel.

Cultural Resources

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would have cumulative effects to cultural resources in the immediate project area. The findings of the updated "Cultural Resources" studies conducted for the Phase 1 Improvements are consistent with the FEIS. Cumulative effects on prehistoric and historic sites are substantial because of past, present, and future disturbance. The FEIS and Phase 1 studies note that consultations with Puyallup Tribe of Indians avoided additional cumulative effects on traditional cultural properties, which remain mostly undocumented. The original 2006 Memorandum of Agreement (MOA) with SHPO and the Puyallup Tribe, and subsequent Amended MOAs signed in December 2009, May 2013, and August 2018 require mitigation for adverse effects. An Unanticipated Discovery Plan (UDP) as required by the current MOA would be developed to describe procedures if archaeological sites or historic resources are encountered during construction.

Environmental Justice

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute cumulative effects on Environmental Justice populations (page 3-322). The 2006 FEIS found that the project would not have disproportionately high and adverse effects on environmental justice populations. The Phase 1 Improvements, considering the changes in alignment and the addition of tolling, are not expected to result in disproportionately high and adverse effects on environmental justice populations, given there would continue to be accessible and convenient un-tolled alternatives.

WSDOT anticipates there would be positive and negative cumulative effects of the Phase 1 Improvements on environmental justice populations in the SR 167 travel shed. The Phase 1 Improvements would contribute to a positive cumulative effect on regional transportation; while the addition of tolling would likely contribute to a negative cumulative effect on the economic burdens of low-income users of SR 167. As described in Attachment B, Environmental Justice Discipline Report, tolls on the new proposed SR 167 Phase 1 Improvements would disproportionately affect low-income populations because the cost to use the new facility would represent a higher proportion of their

household income than middle and high income users. In combination with rising housing costs in the Pierce County and Washington State's regressive tax system described earlier in the discipline report, tolling the new SR 167 Phase 1 Improvements would have a minor contribution to a negative cumulative effect on economic burdens of low-income motorists in the SR 167 travelshed.

Climate Change

The 2006 FEIS did not address future conditions under climate change.

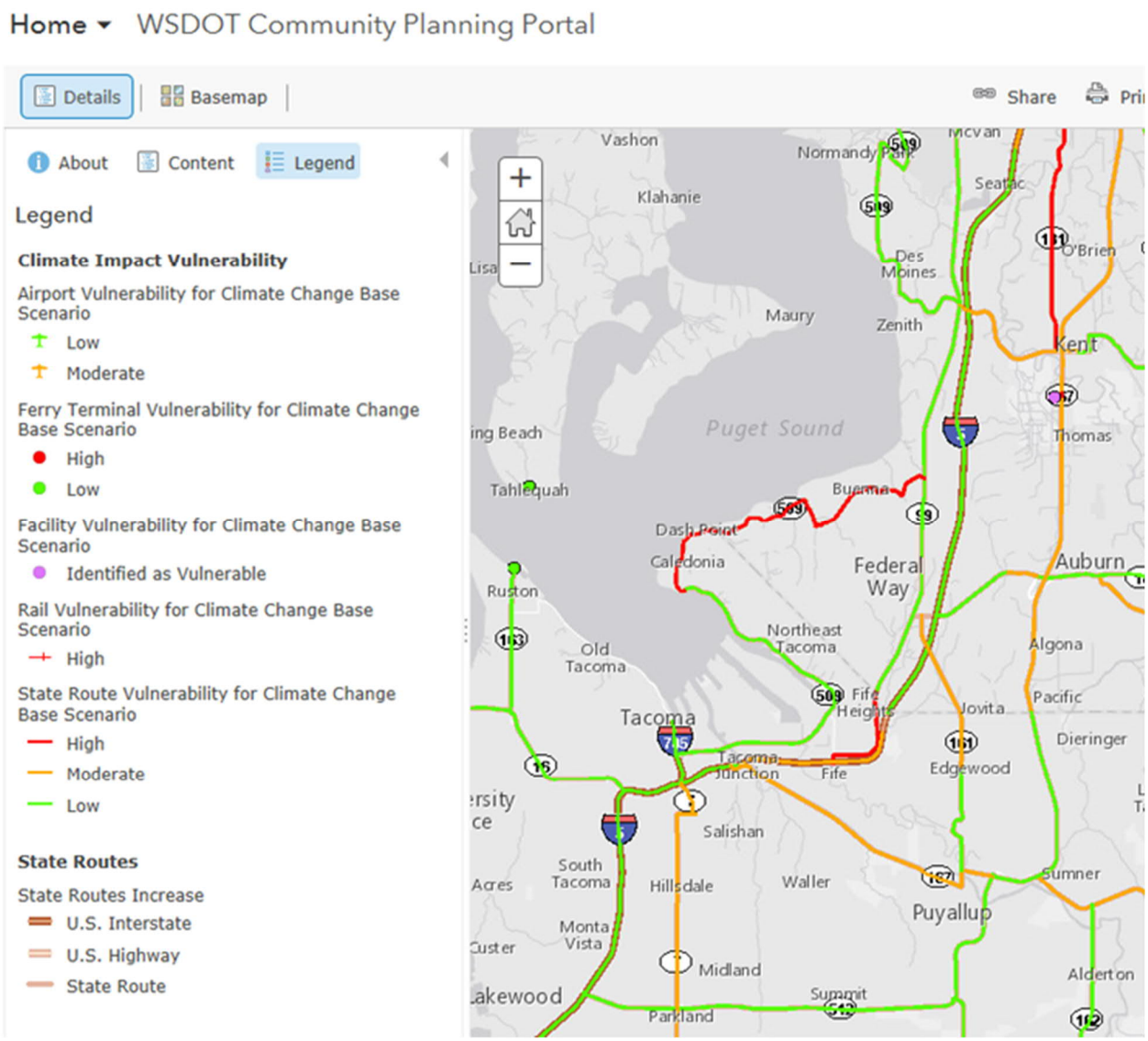
Understanding future climate threats is essential for a safe and sustainable transportation system. WSDOT assessed all of its existing assets for climate risk (WSDOT 2011 Climate Impacts Vulnerability Assessment). Exhibit 4.18-4 shows the results of WSDOT's statewide vulnerability assessment for potential climate risks on state-owned transportation assets in the SR 167 Completion Project Phase 1 Improvements area. Since the proposed Phase 1 Project is a new facility, it was not included in the assessment. However, we can see that the surrounding transportation assets are highly vulnerable to flooding from the Puyallup River and coastal flooding due to gradual sea-level rise. The area is less vulnerable to fire risk or landslides.

The FEIS and this analysis explain how flooding and stormwater affects the project area, and how the RRP helps reduce flood risk and meets or exceeds stormwater control requirements. In addition, the SR 167 Completion Project Phase 1 Improvements team is participating in a pilot project with the Federal Highway Administration and The Netherlands to better understand the process for analyzing infrastructure projects and identifying adaptation strategies to help mitigate the effects of climate change to public infrastructure. As part of the pilot, WSDOT evaluated potential sea-level rise and its impact on the hydrology of the Hylebos Creek and Surprise Lake Tributary, and further evaluated the riparian strategy with updated climate projections.

The Netherlands and FHWA are interested in the SR 167 Completion Project's innovative approach to riparian restoration and floodplain function as a potential climate resilience feature. The Netherlands is studying a highway expansion project (known as Innova58) in South Holland in an area that experiences heavy downpours, which are increasing as the climate changes, resulting in increased localized flooding and driving safety concerns. These two project teams are exchanging ideas and information to help improve assessment tools and strategies.

The proposed Phase 1 Improvements are being planned with the most up to date climate science so that the completed project would be durable throughout its planned lifetime and resilient to extreme events.

Exhibit 4.18-4. WSDOT's Statewide Vulnerability Assessment



Conclusion

Cumulative effects can result from individually minor but collectively substantive actions taking place over a period of time. Cumulative effects include past, present, and reasonably foreseeable future actions within the study area that, together with the project, may have a cumulative effect on the environment. Cumulative effects were found to be similar between the 2006 FEIS and the proposed Phase 1 Improvements. There are no new significant impacts related to cumulative effects compared to the FEIS. Trends affecting the resources remain as described in the 2006 FEIS.

See also Attachment R, Indirect and Cumulative Effects Technical Memorandum.

4.19 Section 4(f) Evaluation

Affected Environment

In July 2012, FHWA issued a revised Section 4(f) Policy Paper that replaced the 2005 version under which the Section 4(f) analysis in the 2006 FEIS was completed (FHWA 2012). The guidance related to identification and consideration of use of Section 4(f) resources was expanded in 2012 to address de minimis impact analysis, and also to expand the guidance on least overall harm among other topics; however, the information contained in Section 5.1.1 of the 2006 FEIS is still applicable for evaluation of the proposed SR 167 Phase 1 Improvements.

Section 5.4 of the 2006 FEIS identified both historic and recreational Section 4(f) resources considered for the preferred Build Alternative. WSDOT has supplemented that identification process with additional review and exploration for cultural and recreational resources for the proposed Phase 1 Improvements. The additional review was undertaken because of the design changes reflected in the Phase 1 Improvements and the length of time that has elapsed since completion of the NEPA documentation and ROD. This 2018 evaluation compares the Section 4(f)-protected resources that would be affected by the Phase 1 improvements to the findings of the 2006 FEIS. Where there would be no change in the effect on the resource, the findings of the 2006 FEIS are unchanged. Updated Section 106 documentation (WA DAHP 2016, WA DAHP 2018a, WA DAHP 2018b, WSDOT 2015, WSDOT 2016, WSDOT 2017, WSDOT 2018a, and WSDOT 2018b) was also reviewed to identify any changes to historic properties and the "Public Services" Technical Memorandum (WSDOT 2018d) was reviewed for information on parklands. If either the status of the Section 4(f) protection of the resource or the design of the SR 167 Completion Project changed since the 2006 FEIS, then the effects of the Phase 1 Improvements were evaluated consistent with 23 CFR 774 and the guidelines contained in Section 457 of the WSDOT Environmental Manual, and FHWA Section 4(f) Policy Paper (FHWA 2012).

Historic Properties

Since the 2007 ROD, WSDOT has completed additional surveys to identify and document historic properties. The ROD included a finding of Adverse Effect for the SR 167 Completion Project. FHWA and WSDOT have continued Section 106 consultation with the State Historic Preservation Officer (SHPO) and amended the Memorandum of Agreement (MOA) in 2013 between SHPO, FHWA, and the US Army Corps of Engineers. The Department of Archaeology and Historic Preservation (DAHP) director is the SHPO for the State of Washington.

The 2015 cultural research investigations' Built Environment survey identified six newly recommended historic properties within the project's revised Area of Potential Effects (APE) eligible for the National Register of Historic Places (NRHP). The 2015 APE is applicable to the Phase 1 Improvements, and is shown in Attachment E. The investigations also determined that five NRHP-eligible historic properties previously identified in the 2006 FEIS were no longer within the APE for the Phase 1 Improvements. A 2017 cultural resources survey was undertaken to investigate previously unsurveyed areas within the proposed Phase 1 Improvements APE. The 2017 survey did not identify any additional NRHP-eligible historic properties. The six additional NRHP-eligible properties that were identified in the 2015 investigations are listed in Exhibit 4.19-1.

Exhibit 4.19-1. Recommended NRHP-eligible Historic Properties in the Proposed Phase 1 Improvements APE that were Not Identified in the 2006 FEIS

Physical Address	2016 Section 106 Effect Determination
6020 8th Street E	Adverse Effect
411 Birch Street	No Effect
4403 Freeman Road E	Adverse Effect
6007 Milwaukee Avenue E	Adverse Effect
6020 Milwaukee Avenue E	No Effect
860 64th Avenue	No Effect

Source: WSDOT 2016

Properties No Longer within the Proposed SR 167 Phase 1 Improvements APE

The five NRHP-eligible properties that are no longer within the APE are listed in Exhibit 4.19-2.

Exhibit 4.19-2. NRHP-Eligible Historic Properties Identified in the 2006 FEIS that are No Longer within the APE

Department of Archaeology and Historic Preservation Identification Number	2006 Section 106 Effect Determination	Physical Address	Change
27-4154	Adverse Effect	6803 20th Street E	Phase 1 Improvements design avoids this property
27-4125	Adverse Effect	7001 20th Street E	Property no longer exists
27-4114	Adverse Effect	7717 Valley Avenue E	Property no longer exists
27-4160	Adverse Effect	3423 Freeman Road	Property located outside of Phase 1 Improvements design APE
Fife-A-1	No Effect	Baggenstos Farm	Property located outside of Phase 1 Improvements design APE

Pursuant to the commitments in the 2007 ROD, two of the properties listed in Exhibit 4.19-2, 7001 20th Street E and 7717 Valley Avenue E were acquired by WSDOT in 2008. Both houses were documented pursuant to DAHP Level 2 standards as stipulated in the Section 106 MOA (FHWA et al. 2006). Materials from both houses were salvaged for re-use and the houses were demolished by WSDOT in 2011. There has been no change to status of other historic properties evaluated in the 2006 FEIS.

Recreational Resource

In support of WSDOT's NEPA Re-evaluation for the proposed Phase 1 Improvements, a Public Services Technical Memorandum was completed on January 26, 2018. The technical memorandum described changes to recreational resources in the study area since the 2006 FEIS. The City of Fife's proposed Pacific National Soccer Park that was identified in the 2006 FEIS to be located within the study area was subsequently terminated by the City in 2007. Additional recreational resources that are now existing or planned within the study area are listed in Exhibit 4.19-3.

Exhibit 4.19-3. Recreational Resources Not Identified in the 2006 FEIS

Jurisdiction	Resource	Description
City of Fife	Colburn Park	A 1.46-acre neighborhood park facility adjacent to the Fife Swim Center on 20th Street E.
City of Fife	5-Acre Park	A 5.3-acre neighborhood park that stretches along Radiance Road, immediately south of the railroad tracks, in a linear fashion and is connected by a paved trail. The park offers walking trails, a playground, and other recreational facilities.
City of Fife	Milgard Nature Area	Along with the Hylebos Nature Area that was identified in the 2016 FEIS, this area has been developed into a habitat restoration project. The City operates and maintains the park with the help of volunteer groups.
City of Puyallup	Grayland Park	Located at 601 N Meridian, this 3-acre neighborhood park is adjacent to the Memorial Center and includes a playground and picnic area.
City of Puyallup	Puyallup Skatepark	Located at 1299 4th Street NW, this 10,000-square-foot skatepark is for skateboarders, rollerbladers, and bicyclists. The park also includes spectator seating.
City of Milton	Milton Community Park	Located at Milton Way and 15th Avenue, this 10-acre park includes ball fields, picnic grounds, tennis courts, a children's play area, and Veterans Memorial.
City of Milton	West Milton Nature Preserve	Located at 604 5th Avenue, this property is a nature preserve that includes the east branch of the Hylebos Creek, known as Sweetwater Creek, and its associated wetlands. The park is focused on the rehabilitation of salmon and trout populations.

Based on available information, the recreational resources listed in Exhibit 4.19-3 are assumed to be publicly owned, substantial, and open to the public, making them eligible for protection under Section 4(f).

One recreational resource identified in the 2006 FEIS, the planned Pacific National Soccer Park, is no longer planned. By late 2006, the City of Fife had decided not to advance the Pacific National Soccer Park and were preparing to develop the property for commercial use. WSDOT subsequently acquired the property from the City of Fife in January 2011.

The planned Lower Hylebos Nature Park identified in the 2006 FEIS has been completed by the City of Fife as the Hylebos Nature Area and is considered in this evaluation as an existing resource (Exhibit 4.19-4). The planned Riverfront Trail identified in the 2006 FEIS has been developed by the City of Puyallup as the Puyallup Riverwalk Trail and is considered in this evaluation as an existing resource (Exhibit 4.19-4). There has been no change to status of other recreational resources evaluated in the 2006 FEIS.

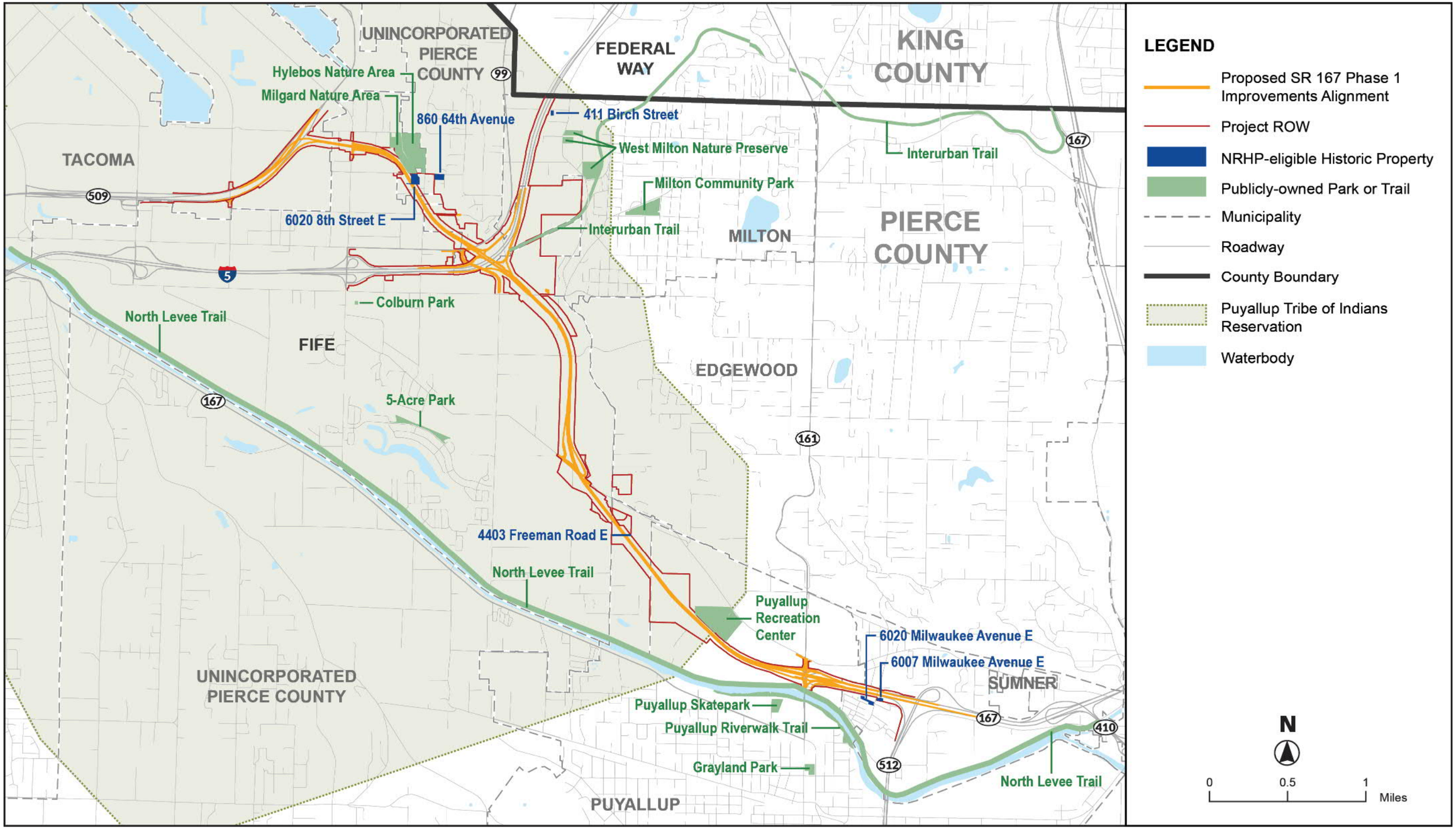
Summary of Section 4(f)-Protected Properties

Based on the supplemental review of historic properties and recreational resources, Exhibit 4.19-4 lists and Exhibit 4.19-5 shows the location of Section 4(f)-protected properties considered in this evaluation.

Exhibit 4.19-4. Section 4(f)-Protected Properties within the Phase 1 Improvements Study Area

Type	Property
NRHP-Eligible Historic Property	6020 8th Street E (house)
NRHP-Eligible Historic Property	411 Birch Street (house)
NRHP-Eligible Historic Property	4403 Freeman Road E (house)
NRHP-Eligible Historic Property	6007 Milwaukee Avenue E (house)
NRHP-Eligible Historic Property	6020 Milwaukee Avenue E (house)
NRHP-Eligible Historic Property	860 64th Avenue (house)
Publicly owned Park	Hylebos Nature Area (identified in 2006 FEIS as planned Lower Hylebos Nature Park)
Publicly owned Trail	Interurban Trail
Publicly owned Trail	Puyallup Riverwalk Trail (identified in 2006 Final EIS as the Riverfront Trail)
Publicly owned Trail	Planned North Levee Trail
Publicly owned Recreation Center	Puyallup Recreation Center
Publicly owned Park	Colburn Park
Publicly owned Park	5-Acre Park
Publicly owned Park	Milgard Nature Area
Publicly owned Park	Grayland Park
Publicly owned Park	Puyallup Skatepark
Publicly owned Parkland	Milton Community Park
Publicly owned Park	West Milton Nature Preserve

Exhibit 4.19-5. Section 4(f)-Protected Properties



Evaluation of Use

Exhibit 4.19-6 summarizes the results of the Section 4(f) evaluation compared to the Section 4(f) findings from the 2006 FEIS. The use of four Section 4(f)-protected properties identified in the 2006 FEIS would no longer occur; however, there would be a use of two additional historic properties that were not identified in the 2006 FEIS. The use of one of those properties also would have occurred with the 2006 FEIS Build Alternative; however, it was not identified as an NRHP-eligible historic property until 2015. The Phase 1 Improvements would result in a use of three Section 4(f)-protected properties: 6020 8th Street E, 4403 Freeman Road E, and the Interurban Trail.

Consideration of Constructive Use

Per 23 Code of Federal Regulations (CFR) 774.15, a constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished. Also, FHWA shall determine when there is a constructive use, but FHWA is not required to document each determination that a project would not result in a constructive use of a nearby Section 4(f) property. However, such documentation may be prepared at the discretion of FHWA.

Exhibit 4.19-6. Comparison Summary of 2006 FEIS and Phase 1 Improvements Section 4(f) Findings

Resource	2006 FEIS Section 4(f) Use	Phase 1 Improvements Section 4(f) Use	2018 Condition Compared to 2006 FEIS
6803 20th Street E	Use	None	Avoided, property not within limits of Phase 1 Improvements
7001 20th Street E	Use	None	Property no longer exists, demolition after 2006
7717 Valley Avenue E	Use	None	Property no longer exists, demolition after 2006
3423 Freeman Road	None	None	No Change
Baggenstos Farm	None	None	No Change
6020 8th Street E	Not Identified as NRHP-eligible[a]	Use	Evaluated in this 2018 analysis; use under 2006 FEIS Build Alternative not previously identified
411 Birch Street	Not Evaluated[b]	None	No Use
4403 Freeman Road E	Not Evaluated[b]	Use	Evaluated in this 2018 analysis as new resource
6007 Milwaukee Avenue E	Not Evaluated[b]	None	No Use
6020 Milwaukee Avenue E	Not Evaluated[b]	None	No Use
860 64th Avenue	Not Evaluated[b]	None	No Use
Hylebos Nature Area (identified in 2006 FEIS as planned Lower Hylebos Nature Park)	None	None	No Change
Planned Pacific National Soccer Park	Use	No Longer a Planned Facility	No longer a planned facility, property never developed as parkland
Interurban Trail	Use	Use	No Change

Exhibit 4.19-6. Comparison Summary of 2006 FEIS and Phase 1 Improvements Section 4(f) Findings

Resource	2006 FEIS Section 4(f) Use	Phase 1 Improvements Section 4(f) Use	2018 Condition Compared to 2006 FEIS
Puyallup Riverwalk Trail (identified in 2006 FEIS as the Riverfront Trail)	None	None	No Change
Planned North Levee Trail	None	None	No Change
Puyallup Recreation Center	None	None	No Change
Colburn Park	Not Evaluated[b]	None	No Use
5-Acre Park	Not Evaluated[b]	None	No Use
Milgard Nature Area	Not Evaluated[b]	None	No Use
Grayland Park	Not Evaluated[b]	None	No Use
Puyallup Skatepark	Not Evaluated[b]	None	No Use
Milton Community Park	Not Evaluated[b]	None	No Use
West Milton Nature Preserve	Not Evaluated[b]	None	No Use

Bold Indicates "Use" resulting from the Phase 1 Improvements

[a] The 2006 FEIS Build Alternative included acquisition and demolition of the property at 6020 8th Street E for conversion to riparian restoration program; however, the house at that address was not identified as NRHP-eligible until 2015.

[b] Property not identified as a Section 4(f)-protected resource in the 2006 FEIS.

WSDOT, in consultation with the SHPO, determined that there would be an adverse effect on the residential property at 6007 Milwaukee Avenue E as a result in changes to setting, feeling, and association because of construction of a noise wall between the property and SR 167. The noise wall, which would reduce traffic noise levels at the property, would be located on WSDOT right-of-way and be visible from the property, resulting in a change in setting to the historic property. A constructive use occurs when:

- The noise-level increase caused by the project substantially interferes with the use and enjoyment of a noise-sensitive Section 4(f)-protected property;
- The proximity of the project substantially impairs esthetic features of a Section 4(f)-protected property, where the features are impotent contributing elements to the value of the property;
- The project results in restrictions in access which substantially diminish the utility of the property;
- The vibration impact from construction or operation substantially impairs use of the property; or
- Ecological intrusion of the project substantially diminishes habitat value of a refuge adjacent to the project.

With the potential proposed noise wall, which is the project element nearest to the property, noise levels at the property would be below the FHWA noise abatement criteria. The property is currently adjacent to an existing portion of the SR 167 highway and the change to visual setting would be blocking views of traffic on the existing highway, which was constructed more recently than the historic property. The change in nonhistoric views of the highway would have an effect on setting of the property; however, it would not substantially diminish the historic property. The noise wall would not block the

primary views of the building, which are from Milwaukee Avenue E and not from SR 167. The project would not change access to the property. The property is currently adjacent to an existing portion of the SR 167 highway and vibration levels would not change. The property is not a wildlife or waterfowl refuge that would experience ecological intrusion. As a result of these conditions, the project would not have a constructive use on 6007 Milwaukee Avenue E.

The 2006 FEIS and Section 4(f) Evaluation included a determination that there would not be constructive use of the Puyallup Riverwalk Trail or the Puyallup Recreation Center. The proposed Phase 1 Improvements design would not worsen noise, visual, or other proximity impacts on these resources; therefore, there would be no change to the 2006 Section 4(f) determination.

The Hylebos and Milgard Nature Areas are adjacent to the proposed Phase 1 Improvements in Fife. The 2006 FEIS included a determination that there would not be constructive use of the Hylebos Nature Area. The Noise Technical Memorandum dated April 18, 2018, completed to support the Phase 1 Improvements NEPA Re-evaluation confirmed that noise levels on the public trails in the Hylebos and Milgard Nature Areas would be less than the FHWA noise abatement criteria. The project would provide enhancement to the nature areas by extending the trail system farther south along Hylebos Creek. Otherwise the conditions have not substantially changed since the 2006 FEIS, and the determination that there would be no constructive use of the Hylebos Nature Area remains valid and would also apply to the Milgard Nature Area.

The other identified public parks and trails are farther removed from the Phase 1 Improvements and do not warrant individual constructive use consideration.

Avoidance Alternatives

The 2006 FEIS and Section 4(f) Evaluation investigated a range of avoidance alternatives and determined that there was not a feasible and prudent avoidance alternative to the use of Section 4(f) properties. The Tier I and Tier II analysis remains valid for the project overall. The Phase 1 Improvements would use two individual properties that were not identified in the 2006 FEIS. Analysis of specific alternatives to avoid these two properties is included in this evaluation.

A "feasible and prudent" avoidance alternative is defined in 23 CFR 774 as an alternative that avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting Section 4(f) properties. An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is not prudent if:

- It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- It results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes:
    - Severe social, economic, or environmental impacts
    - Severe disruption to established communities
    - Severe disproportionate impacts on minority or low-income populations or
    - Severe impacts on environmental resources protected under other Federal statutes
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude
- It causes other unique problems or unusual factors or

- It involves multiple factors in [the list above], that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude

The two newly evaluated Section 4(f)-protected properties, 6020 8th Street E and 4403 Freeman Road E, are located at opposite ends of the study corridor and separated by I-5 (Exhibit 4.19-5).

Summary

Alternatives to the Phase 1 Improvements in the vicinity of 6020 8th Street would use Section 4(f)-protected resources.

As detailed above, there is not a feasible and prudent avoidance alternative to the use of Section 4(f)-protected resources for the property at 4403 Freeman Road E. Shifting the alignment north and east would cause severe impacts on waters of the U.S., economic impacts, require acquisition of land in federal trust for a Native American tribe member, and result in extraordinary additional construction costs. Cumulatively, the economic impacts, environmental impacts on resources protected under other federal statutes, and an extraordinary increase in construction costs results in a determination that the north and east shift is not prudent. Shifting the alignment west is constrained by PTOI Tribal Trust Lands, resulting in a determination that the west shift is not feasible.

Finding of Least Overall Harm

The documentation completed for the 2006 FEIS continues to remain valid in identifying the project as the Least Overall Harm Alternative. As described above, alternative alignments that would avoid the Section 4(f)-protected property at 6020 8th Street E would use land from other Section 4(f)-protected properties. In accordance with FHWA guidance (FHWA 2012), identifying which alternative would have least overall harm includes consideration of the following seven factors:

- The ability to mitigate adverse impacts on each Section 4(f) property (including any measures that result in benefits to the property);
- The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- The relative significance of each Section 4(f) property;
- The views of the officials with jurisdiction over each Section 4(f) property;
- The degree to which each alternative meets the purpose and need for the project;
- After reasonable mitigation, the magnitude of any adverse impacts on resources not protected by Section 4(f); and
- Substantial differences in costs among the alternatives.

Not all factors are differentiators between all alternatives.

The proposed Phase 1 Improvements and both alignment shift options to avoid 6020 8th Street E would result in the use of Section 4(f)-protected resources (Exhibit 4.19-7); therefore, an analysis of which alternative would have the least overall harm is required. The least overall harm analysis does not consider the use of 4403 Freeman Road E because all three alignment options in the vicinity of 6020 8th Street E would have identical use of 4403 Freeman Road E and the above analysis determined that there is not a feasible and prudent avoidance alternative to the use of 4403 Freeman Road E.

Exhibit 4.19-7. Summary of Alternatives Considered for Least Overall Harm

Alternative	Section 4(f)-protected Properties with Use
Phase 1 Improvements	6020 8th Street E, 4403 Freeman Road E
Alignment Shift Option North of 6020 8th Street E	Hylebos Nature Area, Milgard Nature Area, 4403 Freeman Road E
Alignment Shift Option South and West of 6020 8th Street E	6020 8th Street E (Constructive Use), 4403 Freeman Road E

Summary

The overall harm to Section 4(f)-protected property would be less for the proposed Phase 1 Improvements than if the alignment were shifted north to use land from the Hylebos and Milgard Nature Areas or south to follow the 2006 FEIS Build Alternative alignment. The north alignment shift would affect resources that are relatively more substantial and would cause harm to protected wetland, stream, and wildlife habitat. The south and west alignment shift option would result in a constructive use of the same Section 4(f)-protected property as the proposed Phase 1 improvements, would result in additional business displacements, and would cost substantially more than the Phase 1 Improvements.

Coordination

FHWA and WSDOT have engaged in continued consultation and coordination related to Section 4(f)-protected properties since completion of the 2006 FEIS and 2007 ROD. Project changes that have resulted from the proposed Phase 1 Improvements design have been coordinated with the SHPO.

The draft of this Section 4(f) Evaluation detailing the updated Section 4(f) Evaluation was circulated to the U.S. Department of the Interior per 23 CFR 774.5 for review prior to FHWA making its final determination. On July 17, 2018, the U.S. Department of the Interior Regional Environmental Officer responded that the department has no objection to Section 4(f) approval of this project.

Conclusion

The 2006 FEIS and Section 4(f) Evaluation concluded that there was no feasible and prudent alternative to the use of land from Section 4(f)-protected properties and the proposed action included all possible planning to minimize harm resulting from such use. That analysis is unchanged for the Interurban Trail. For the two NRHP-eligible historic properties now identified for use by the proposed Phase 1 Improvements (6020 8th Street E and 4403 Freeman Road East), this analysis concludes that there is no feasible and prudent alternative to the use of land from the two properties, and that the Phase 1 Improvements include all possible planning to minimize harm and constitute the alternative with least overall harm.

See also Attachment S, Section 4(f) Evaluation.

5. CONCLUSION

As discussed in the Re-evaluation and shown in Exhibits 3.3-2 and 3.3-3, the Phase 1 Improvements are planned to be completed within the same footprint, and approximately the same alignment as proposed in thee 2006 FEIS for the Build Alternative. The current conditions of the project area remain largely unchanged from the time of the preparation of the 2006 FEIS. As discussed in detail in Section 4.0, the changes that have occurred do not affect the conclusions reached in the 2006 FEIS. Therefore, the impacts and mitigation measures set forth in the 2006 FEIS remain applicable to the Phase 1 Improvements, and there are no new significant impacts.

The project remains in compliance with the Determinations and Findings listed in the 2007 Record of Decision, including Environmental Justice, Conformity with Air Quality Plans, Endangered Species Act, Magnuson-Stevens Act, Section 4(f), and Section 106.

6. REFERENCES

Associated General Contractors of Washington. (AGCW). (1997). Guide to Handling Fugitive Dust from Construction Projects. Seattle, Washington.

Barnard, R.J., J. Johnson, P. Brooks, K.M. Bates, B. Heiner, J.P. Klavas, D.C. Ponder, P.D. Smith, and P.D. Powers. (2013). Water Crossings Design Guidelines. Washington Department of Fish and Wildlife, Olympia, Washington.

Brinson M.M. (1993). A hydrogeomorphic classification for wetlands. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report WRP-DE-4.

City of Edgewood. (2015). Comprehensive Plan. Updated and adopted in 2015. Edgewood, Washington

City of Fife. (2014). Parks, Recreation and Open Space Plan. Fife, Washington.

City of Fife. (2015). Comprehensive Plan. Fife, Washington.

City of Fife. (2017). Fife Municipal Code. Title 17 Environmental Protection. Chapter 17.15 Fish and Wildlife Habitat Conservation Areas and Chapter 17.7 Wetlands. Available: http://www.codepublishing.com/wa/fife/ visited on November 2, 2017.

City of Milton. (2017). Online information request sent to the City regarding future permitted development located near the SR 167: Tacoma to Puyallup New Freeway Project Area, October 2017. Response received on November 21, 2017.

City of Puyallup. (2017). Puyallup Municipal Code. Title 21 Environment. Chapter 21.06 Critical Areas. Article IX Wetlands and Article X Fish and Wildlife Habitat Areas. Available : http://www.codepublishing.com/wa/puyallup/ visited on November 2, 2017.

City of Puyallup. (2017). Online information request sent to the City regarding future permitted development located near the SR 167: Tacoma to Puyallup New Freeway Project Area, October 2017. Response received on November 27, 2017.

City of Tacoma. (2017). Municipal Code. Title 13 Land Use Regulatory Code. Chapter13.11 Critical Areas Preservation. Available: http://cms.cityoftacoma.org/cityclerk/Files/MunicipalCode/Title13-LandUseRegulatoryCode.PDF visited on November 2, 2017.

David Evans and Associates. (2005). State Route 167, Tier II EIS. Wildlife, Fish Threatened and Endangered Species Discipline Report. Final.

eBird. (2018). On-line tracking system for bird records worldwide, created and supported by Cornell Lab of Ornithology. Available: https://ebird.org/home visited on March 1, 2018.

EJ Screen. (2017). EJSCREEN ACS Summary Report. Available: https://ejscreen.epa.gov/mapper/.

Environmental Systems Research Institute (ESRI). (2017). ESRI Imagery Basemap (aerial photos). Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Federal Emergency Management Administration (FEMA). (2017). Federal Emergency Management Act, National Flood Hazard Layer. March. Available: https://www.fema.gov/national-flood-hazard-layer-nfhl.

Fehr and Peers. (2011). Tideflats Area Transportation Study (TATS). Final Report.

Federal Geographic Data Committee (FGDC). (2013). Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington D.C. Available: http://www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands/nvcs-2013.

Hruby T. 2004. Washington State wetland rating system for Western Washington - Revised. Washington State Department of Ecology Publication # 04-06-025. Available: https://fortress.wa.gov/ecy/publications/SummaryPages/0406025.html.

Hruby T. 2014. Washington State wetland rating system for Western Washington – 2014 Update. Washington State Department of Ecology Publication # 14-06-029. Available: https://fortress.wa.gov/ecy/publications/SummaryPages/1406029.html.

Information for Planning and Consultation (IPaC). (2018). On-line U.S. Fish and Wildlife Service resource. Available: https://ecos.fws.gov/ipac/ visited on February 2, 2018.

National Marine Fisheries Service (NMFS). (2018). State Route 167 Completion Project Stage 1 – ESA Section 7 Formal Reinitiation. NMFS 448 Tracking number: 2005/05617, 2012/03666. April 16.

Natural Resources Conservation Service (NRCS). (2017a). Field Office Technical Guide. US Department of Agriculture. Climate Data for Pierce County, Station McMillin Reserviour, Washington 455224. Available: http://agacis.rcc-acis.org/53053/mtot visited on November 2, 2017..

Natural Resources Conservation Service (NRCS). (2017b). National List of Hydric Soils: Pierce County (WA). Available: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/ visited on November 2, 2017.

Natural Resources Conservation Service (NRCS). (2017c). Official Soil Series Descriptions. Available: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053587 visited on November 2, 2017.

Natural Resources Conservation Service (NRCS). (2017d). Soil Survey Geographic Database for Washington (SSURGO), Map Units. Accessed from WSDOT Environmental Workbench. November 2, 2017.

Null WS, Skinner G, Leonard W. 2000. Wetland functions characterization tool for linear projects. Olympia (WA): Washington State Department of Transportation, Environmental Affairs Office. Available: http://www.wsdot.wa.gov/NR/rdonlyres/B92BE0D4-9078-4EFC-99DA-3C0EA4805E2F/0/bpjtool.pdf.

Pierce County. (2004). Pierce County Commute Trip Reduction (CTR) Program. Pierce County, Washington.

Pierce County. (2015b). Coordinated Transit-Human Service Transportation Plan. Pierce County, Washington.

Pierce County .(2016). Comprehensive Plan. Pierce County, Washington.

Pierce County. (2017). Pierce County Charter. Title 18E Development Regulations – Critical Areas. Chapter 18E.30 Wetlands and Chapter 18E.40 Regulated Fish and Wildlife Species and Habitat Conservation Areas. Available: http://www.codepublishing.com/WA/PierceCounty/#!/html/PierceCounty18E/PierceCounty18E.html visited on November 2, 2017.

Plotnick, R., Romich, J., Thacker, J. University of Washington. (2009). The Impacts of Tolling on Low-Income Persons in the Puget Sound Region.

Port of Tacoma. (2014). Land Use and Transportation Plan 2014. Tacoma, Washington.

Puget Sound Regional Council (PSRC). (1996). The Destination 2030 Metropolitan Transportation Plan.

Puget Sound Regional Council (PSRC). (2009). Vision 2040. Seattle, Washington. December 2009.

Puget Sound Regional Council (PSRC). (2014). Coordinated Transit-Human Services Transportation Plan 2015-2018.

Puget Sound Regional Council (PSRC). (2015). Transportation 2040. Available: https://www.psrc.org/our-work/transportation-2040.

Puget Sound Regional Council (PSRC). (2015). 2015 Covered Employment Estimates by Jurisdiction; Land Use Version 1 (LUV.1) Data Set. Seattle, Washington.

United States Census Bureau. (2011-2015). 2011-2015 American Community Survey 5-Year Estimates. Available: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_B03002&prodType=table.

U.S. Army Corps of Engineers (USACE). (2009). Department of the Army reference NWS-2008-1445.

U.S. Army Corps of Engineers (USACE). (2010). Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).Wakeley JS, Lichvar RW, Noble CV (eds). Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp2.pdf

U.S. Department of Transportation Federal Highway Administration (FHWA). (1988). Visual Impact Assessment for Highway Projects. Available: http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf visited in March 1988.

U.S. Department of Transportation Federal Highway Administration (FHWA). (2006). SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement. November 9, 2006.

U.S. Department of Transportation. Federal Highway Administration (FHWA). (2006). Memorandum of Agreement between the Federal Highway Administration, the U.S. Army Corps of Engineers, and the Washington State Historic Preservation Officer Pursuant to 36 CFR Part 800.6(a) Regarding the SR 167 Puyallup to SR 509 Project, Pierce County, Washington. November 8, 2006.

U.S. Department of Transportation Federal Highway Administration (FHWA). (2012). Federal Highway Administration Office of Planning, Environment, and Realty Project Development and Environmental Review. July 20, 2012. Section 4(f) Policy Paper.

U.S. Environmental Protection Agency (EPA). (1971). Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Washington, D.C.

U.S. Environmental Protection Agency (EPA). (1999). National Air Toxics Assessment (NATA), Updated 2014. Available: https://www.epa.gov/national-air-toxics-assessment.

U.S. Fish and Wildlife Service (USFWS). (1996). National Wetland Inventory. U.S. Department of the Interior. [Accessed from WSDOT Environmental Workbench 2015 Sept 28]. Available: http://www.fws.gov/wetlands/data/index.html.

U.S. Geological Survey (USGS). (2017). 7.5 Minute Quadrangle Map. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Washington Department of Fish and Wildlife (WDFW). (2017b). Priority Habitats and Species Program. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Washington Office of Superintendent of Public Instruction. (2006). Enrollment Reports 2005-06 848. Available: http://www.k12.wa.us/DataAdmin/enrollment.aspx.

Washington Office of Superintendent of Public Instruction. (2016). 2015-16 School Report Card. Available: http://reportcard.ospi.k12.wa.us/summary.aspx.

Washington State Department of Archaeology and Historic Preservation (DAHP). (2016). Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509. October 6, 2016.

Washington State Department of Archaeology and Historic Preservation (DAHP). (2018). Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – More Information Needed. March 8, 2018.

Washington State Department of Archaeology and Historic Preservation (DAHP). (2018). Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – ADVERSE Effect. March 14, 2018.

Washington State Department of Ecology (Ecology). (2017). Converting scores for categories and function scores between the 2004 and 2014 rating systems. Available: http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/2014updates.html visited on November 2, 2017.

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10 (Ecology, USACE, & EPA). (2006). Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1). Washington State Department of Ecology Publication #06-06-011b. Olympia, WA. Available: http://www.ecy.wa.gov/pubs/0606011b.pdf visited in March 2006.

Washington State Department of Transportation (WSDOT). (1996). Washington State Annual Collision Summary. Available: http://wtsc.wa.gov/wp-content/uploads/2017/02/2015_Annual_Collision_Summary.pdf.

Washington State Department of Transportation (WSDOT). (1996). Roadside Classification Plan. Out of print, no longer available.

Washington State Department of Transportation (WSDOT). (2001). SR 167 Tier II EIS Traffic Report. December 2001.

Washington State Department of Transportation (WSDOT). (2004). State Route 167: State Route 509 to Puyallup Noise Technical Report. Olympia, Washington. February.

Washington State Department of Transportation (WSDOT). (2006). SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation. November 2006.

Washington State Department of Transportation (WSDOT). (2007) SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation Record of Decision. October 2007.

Washington State Department of Transportation. (2007). Providing Meaningful Language Assistance. Available: http://www.wsdot.wa.gov/sites/default/files/2007/09/11/LEPPlan.pdf. Last updated September 11, 854 2007. 855.

Washington State Department of Transportation (WSDOT). (2008). Guidance on Preparing Cumulative Impact Analysis. Available: http://www.wsdot.wa.gov/sites/default/files/2017/11/09/ENV-NSEPA_YellowCumEffGuid.pdf.

Washington State Department of Transportation (WSDOT). (2011). Climate Impacts Vulnerability Assessment. November 2011.

Washington State Department of Transportation (WSDOT). (2015). Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project–Puyallup to SR 509, Pierce County, Washington. December 2015.

Washington State Department of Transportation (WSDOT). (2015). Roadside Policy Manual. M 3110.03. August 2015. Available: https://www.wsdot.wa.gov/publications/manuals/fulltext/M3110/RPM.pdf.

Washington State Department of Transportation (WSDOT). (2016). Wetland Inventory Technical Memorandum, SR 167 Extension Project – Puyallup to SR 509. Prepared by WSDOT OR EHS Office – Olympia, Washington. November 20, 2012.

Washington State Department of Transportation (WSDOT). (2016). Letter to Allyson Brooks, SHPO, from Roger Kiers, WSDOT Archaeologist. SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation. September 28, 2016.

Washington State Department of Transportation (WSDOT). (2016). Highway Runoff Manual – Supplement. February 2016 [M 31-16.04]. Olympia, Washington.

Washington State Department of Transportation. (2016). Washington State Department of Transportation Bird Conservation Plan. Prepared by WSDOT Fish and Wildlife Program Staff, Olympia WA.

Washington State Department of Transportation (WSDOT). (2017). Environmental Manual. M 31-11. June.

Washington State Department of Transportation (WSDOT). (2017). Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington. December 2017.

Washington State Department of Transportation (WSDOT). (2017). Puyallup to SR 509, Pierce County, Washington. Short Report DOT17-03. Prepared for WSDOT by Archaeological and Historical Services, Eastern Washington University. December 2017.

Washington State Department of Transportation (WSDOT). (2018). Environmental Manual M 31-11.13. August 27, 2018.

Washington State Department of Transportation (WSDOT). 2018. Commute Trip Reduction.

Washington State Department of Transportation (WSDOT) and CH2MHill. (2005). Final State Route 167 Tier II EIS Wetlands Discipline Report. Prepared by WSDOT OR EHS Office – Olympia, and CH2M Hill – Bellevue, Washington.

Attachments

Transportation

COPY TO:	Project File
PREPARED BY:	Chris Wellander, Transportation Lead, WSP USA
DATE:	May 3, 2018
SUBJECT	Transportation Discipline Report for NEPA Re-Evaluation of Phase 1, SR 167 Completion Project

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Acronyms and Abbreviations

AADT	annual average daily traffic
ADT	average daily traffic
AM	morning (AM) peak hour
AVO	average vehicle occupancy
CD	collector/distributor lanes
DDHV	directional design hourly volume
DDI	diverging diamond interchange
DTA	Dynamic Traffic Assignment
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
GP	General purpose
HCM	Highway Capacity Manual
HOV	High Occupancy Vehicle
HSM	Highway Safety Manual
I-5	Interstate 5
ITS	Intelligent transportation system
LOS	Level of service
LRT	Light rail transit
MP	Milepost
MPH	Miles per hour
na	Not applicable
NEPA	National Environmental Policy Act
PM	afternoon (PM) peak hour
PTOI	Puyallup Tribe of Indians
PSRC	Puget Sound Regional Council
ROD	Record of Decision
ROW	right of way
RRP	Riparian Restoration Program
SOV	Single Occupancy Vehicle
SPUI	Single point urban interchange
SR	State Route
TDM	Transportation demand management
TDR	Transportation Discipline Report
TSM	Transportation Systems Management

TIP	Transportation Improvement Plan
VPH	Vehicles per hour
WSDOT	Washington State Department of Transportation

1

Executive Summary

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This Transportation Discipline Report (TDR) was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) findings issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws and regulations, and the project study area are discussed as they relate to transportation.

The purpose of the SR 167 Completion Project has not changed since the 2007 ROD. The purpose is to improve regional mobility of the transportation system to serve multimodal, local, and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS presented year 2000 existing conditions and a horizon year of 2030 for the No Build and Build conditions. While AM and PM operations on I-5 were discussed in the 2006 FEIS, only PM peak hour conditions were reported for local roadway intersection operations. Since the 2006 FEIS was based on year 2000 conditions, it was determined that it was necessary to update existing conditions to more current conditions. Consequently, this 2018 TDR presents 2016 existing conditions and a horizon year of 2045 (approximately 20 years beyond the anticipated opening of Phase 1- Stage 1) for No Build and Build conditions for AM and PM peak hour operations for both freeway and arterial intersection operations. The 2006 FEIS Build Alternative did not include tolls on the project roadways, and used traditional travel modeling tools to assess expected roadway performance. The analysis supporting this 2018 TDR includes the assumption of tolled roadways, and is based on results from a dynamic traffic assignment (DTA) model that more accurately assesses current and future freeway conditions compared to the 2006 analysis, particularly under congested conditions.

This TDR indicates that with adherence to current regulatory requirements, there are no new transportation impacts that would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS.

The following are significant system performance conclusions from the evaluation.

Circulation Changes. The improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide generally similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS, with the following notable differences:

- In comparison to the grade separated connection in the 2006 FEIS Build Alternative, the at-grade connection through the SR 509 intersection at Alexander Road in the Build Phase 1 Improvements will result in increased travel time between the SR 167/I-5 interchange and downtown Tacoma and Port facilities west of Alexander Road.

- Local access to the new SR 167 to/from the east will not be provided from Valley Avenue with the Phase 1 Improvements. While this configuration provides local access benefits in comparison to the No Build condition, the benefits are not as large as were provided by the full diamond interchange proposed in the 2006 FEIS at this location.
- No Park-and-Ride lots are proposed in the Phase 1 Improvements as compared to two new Park-and-Ride facilities proposed in the 2006 FEIS improvements.
- Tolling of the new SR 167 extension and SR 509 Spur with the Phase 1 Improvements will provide the capability to sustainably manage traffic demand on the new facilities.

Freeway Performance. Regarding operations on SR 167, the improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide similar or better performance than what was indicated in the 2006 FEIS. Table ES-1 shows projected AM and PM peak period average corridor speeds on I-5 for the study area. These speeds were derived from the DTA model. For I-5, changes to freeway operations performance for the Phase 1 Improvements are generally similar to those with the Build Alternative assessed in the 2006 FEIS, though there are some differences. With the 2006 FEIS No Build, I-5 was projected to operate under congested conditions (LOS E or F) northbound in the AM and southbound in the PM peak hours between the Puyallup River Bridge and the Fife curve north of the 54th Avenue interchange. Under the Build conditions, the 2006 FEIS projected an improved level of service northbound in the AM peak hour on I-5 between the Port of Tacoma Road and proposed SR 167 interchange; however, north of that point to SR 18 it projected LOS F conditions. For the PM peak hour in the southbound direction, the 2006 FEIS projected LOS F conditions on I-5 between SR 18 and the proposed SR 167 interchange, but south of that point until the Port of Tacoma Road interchange, conditions would improve over the No Build conditions. In comparison, the current analysis indicates that in 2045 with both the No Build and the Build Phase 1 Improvements, I-5 is expected to operate at LOS F during the peak periods in the peak directions (AM northbound and PM southbound), though the proposed Phase 1 Improvements are expected to improve PM southbound speeds from 19 mph to 31 mph. Other peak direction I-5 speeds are expected to be slightly degraded with the proposed Phase 1 Improvements (by 5 mph or less) except for northbound between the proposed SR 167 interchange and SR 18, which is expected to be reduced from 35 mph to 29 mph in the AM peak period; and from 46 mph to 37 mph in the PM peak period. It is important to note that the DTA model shows these speeds remain unchanged from No Build conditions for year of opening with WSDOT's planned Stage 2 Triangle Project improvement, which provides a second northbound offramp lane from I-5 to eastbound SR 18.

Table ES-1. Future (2045) Estimated Peak Period Average I-5 Travel Speeds

I 5 Segment	Direction	2045 Average Speeds (mph)			
		AM Peak Period (6:00 9:00 AM)		PM Peak Period (3:00 6:00 PM)	
		No Build	Build Phase 1 Improvements	No Build	Build Phase 1 Improvements
I-705 to SR 167	NB	32	28	49	46
	SB	50	49	16	15
SR 167 to SR 18	NB	35	29	46	37
	SB	54	52	19	31
Corridor Average: I-705 to SR 18	NB	34	29	48	43
	SB	52	50	17	19

Indicates speeds improve by 10 mph or more.
Indicates speeds degrade by 10 mph or more.

Peak Period Travel Times. Table ES-2 shows travel times during the AM and PM peak periods between key activity nodes in both directions for the routes in the study area. The Table shows estimated travel times derived from the DTA model between nodes using current routes, and also for routes using the new facilities, where applicable. For current routes, AM peak period travel times would be generally the same with Build conditions compared to No Build, with slight increases for some routes, and decreases for others. Routes 3 and 5, which connect the Port of Tacoma with Sumner and Puyallup respectively, show a decrease in travel times via the current routes, which indicates that trips would shift away from current routes onto the new SR 167 connection. For routes 2 through 5, travel times for trips using the Build facilities are notably improved over the corresponding trips in the No Build condition for all directions. Most notable travel time reductions include:

- Puyallup and I-5 north - decreases by seven minutes northbound and seven minutes southbound
- The Port of Tacoma and Sumner - decreases by six minutes eastbound and seven minutes westbound
- Port of Tacoma and Puyallup – decreases by five minutes eastbound and 12 minutes westbound

Travel time route 1, reflecting travel on I-5 between I-705 and SR 18, shows a slight increase in travel times due to the higher volumes of traffic using this section, while travel times on Route 4 between the Port of Tacoma and SR 18 (east of SR 167) are expected to decrease by two minutes northbound and one minute southbound.

In the PM peak period, travel times using current routes would be generally lower with Build conditions indicating that trips would shift away from current routes onto the SR 167 extension. For routes 2 through 5, travel times for trips using the Build facilities are projected to improve over the corresponding trips in the No Build condition for all directions. Most notable travel time reductions include:

- Puyallup and I-5 north - decreases by six minutes northbound and seven minutes southbound
- Port of Tacoma and Sumner - decreases by nine minutes eastbound and 15 minutes westbound
- Port of Tacoma and SR 18 east of SR 167 – decreases by eight minutes northbound and 24 minutes southbound
- Port of Tacoma and Puyallup – decreases by nine minutes eastbound and 11 minutes westbound

Table ES-2. Future (2045) AM and PM Peak Period Travel Times

Travel Paths		Direction	Via Current Route (minutes)		Via Build Route (minutes)
ID #	Path Description		No Build AM (PM)a	Build Phase 1 Improvements AM (PM)a	Build Phase 1 Improvements AM (PM)a
1	Through study area on I-5 (I-705 to SR 18)	NB	15 (11)	18 (12)	N/A
		SB	9 (28)	10 (25)	N/A
2	Puyallup to north of SR 18	NB	22 (18)	21 (18)	15 (12)
		SB	18 (22)	19 (21)	11 (15)
3	Port of Tacoma to Sumner/Pacific MIC	EB	25 (26)	24 (25)	19 (17)
		WB	24 (37)	22 (28)	17 (22)
4	Port of Tacoma to SR 18	NB	18 (17)	20 (19)	16 (9)
		SB	14 (34)	16 (24)	13 (10)
5	Port of Tacoma to Puyallup	EB	20 (24)	18 (20)	15 (15)
		WB	27 (29)	21 (24)	15 (18)

Notes:
N/A = Not applicable
[a]The AM peak period is 6:00 a.m. to 9:00 a.m., while the PM peak period is 3:00 p.m. to 6:00 p.m.

Intersection Level of Service (LOS). Table ES-3 presents a summary of intersections that would meet levels of service (LOS) standards in 2045. Under the 2045 Build condition, overall intersection performance would improve compared to No Build. In the 2045 AM peak hour, 20 of the 38 study intersections in the No Build condition are forecast to operate at or below the current LOS standard of D, compared to 10 of the 44 intersections in the Build condition. In the No Build condition, six intersections operate at LOS F, whereas, in Build condition, all the intersections operate at LOS E or better. This is due to forecasted redistribution in traffic demand volumes and selected intersection improvements under the Build condition. All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the AM peak hour.

Table ES-3. Summary of Future Intersection Locations that Meet LOS Standards

Category	2045 AM Peak Hour		2045 PM Peak Hour	
	No Build	Build Phase 1 Improvements	No Build	Build Phase 1 Improvements
Number of Study Intersections	38	44	38	44
Locations above LOS Standard	18	34	21	33
Locations at LOS Standard	5	8	4	8
Locations below LOS Standard	15	2	13	3
Locations in Build Condition Requiring Mitigation	N/A	0	N/A	0

Notes:
N/A = Not applicable to this category
An intersection in the Build Condition is required to have mitigation if it is below the LOS Standard (LOS D) and has higher delay than the comparable No Build condition.

As shown in the Table, 17 of the 38 study intersections in the No Build condition are forecast to operate at or below LOS D standard in the 2045 PM peak hour, compared to only 11 of the 44 intersections in the Build condition. In the No Build condition, 13 intersections operate at LOS E or F, whereas, in the Build condition no intersections operate at LOS F and only three are expected to operate at LOS E. One intersection, Alexander Avenue/SR 509 (northbound), would operate at LOS D in the Build condition, though it would operate at LOS C in the No Build condition. The slight degradation in operations is due to a higher redistribution of trips to this area in the Build versus the No Build condition. However, the intersection meets the LOS D threshold and does not require mitigation. All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the PM peak hour with the exception of the relocated SR 99/70th intersection, which is projected to operate at LOS D. This compares to LOS F for the SR 99/70th Avenue intersection under the No Build conditions.

Traffic Safety Performance. Safety effects of the proposed Phase 1 Improvements are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "Construction of the Build Alternative is expected to reduce the number of accidents within the corridor by providing a safer facility with full-access control. Year 2030 congestion levels at many key intersections will be lower than the No Build Alternative, which should result in a reduced number of accidents occurring at these intersections."

Effects on Freight. The effects of the proposed Phase 1 Improvements on Port of Tacoma and railroad activities are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "The Build Alternative will greatly improve traffic traveling to and from the Port of Tacoma. The northbound I-5 access will be more direct via SR 167 with free-flowing conditions. Port traffic to Eastern Washington can remain on SR 167 to access I-90 via I-405 or SR 18 in Kent, avoiding the steep grade portion of SR 18 near I-5."

AM peak period travel time savings for key freight origin/destination pairs range from 11% to 48% for the Build Phase 1 Improvements. No other impacts are expected to railroad facilities or service.

Impacts on Transit and HOV. Transit facilities and routes will not be impacted by the proposed facility. The proposed SR 167 extension does create opportunities for new routes to service the Sumner area should Pierce Transit view that as a viable transit market. Two park-and-ride lots were included in the 2006 FEIS, but are not included in the list of Phase 1 Improvements. Further, the 2006 FEIS assumed that direct freeway connections would be provided for the SR 167 general-purpose and HOV lanes at the I-5/SR 167 interchange. While current design options for this interchange do not include HOV direct connections, the designs do not preclude them.

Conclusions. Overall, this transportation re-evaluation analysis indicates that even with the updated assumptions and methodologies, there would be an improvement in traffic operations and no new negative traffic effects as a result of the Build Phase 1 Improvements.

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This Transportation Discipline Report (TDR) was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not originally captured in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project and the project study area are discussed as they relate to transportation.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the Interstate 5 (I-5) corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consisted of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1 for specifics regarding the scope of the 2006 FEIS Build Alternative.

FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability. The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to I--5 near the 70th Avenue crossing (over I-5). The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 for specifics regarding the scope of the Phase 1 Improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond offramp and onramp	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

Studies Performed and Coordination

The methodology and assumptions used to analyze the existing and future traffic conditions have been updated since the 2006 FEIS. Several advancements in travel demand forecasting and traffic analysis have been made since the work completed in the 2006 effort. While current travel demand forecasting techniques continue to follow a similar four-step process as used in the past, including trip generation, distribution, mode choice and assignment—the discrete steps have seen advancements in data supply and competency. Trip generation information is continuously updated and travel demand and traffic assignment models today have been refined in order to reflect changes in trip generations rates, linking of trips, time distribution of trips, and activity generation centers. Trip distribution is also significantly improved in current models as minor arterials and streets are better represented in the models as well as the volume, speed, and delay functions. Mode choice models and the ability to better model bus transit, carpools, vanpools, as well as light rail transit (LRT) are present with current tools. This report and associated analysis has been conducted with these updated modeling tools.

The operational analysis tools have also seen significant improvements in technology approaches, and robustness. The 2006 analysis was based on an older version of the Highway Capacity Manual procedures. These procedures have seen multiple updates in analysis methodology as well as the underlying speed-flow curves. At the time of the 2006 analysis, dynamic traffic assignment (DTA) tools were not available as the technology and software packages did not exist. The current simulation-based DTA model tools, e.g., Dynameq by INRO, allow for blending of traffic assignment capabilities with the intersection/link operational analysis characteristics of traffic simulation tools; hence providing more accurate traffic forecast assignments. Additionally, these tools are better able to reflect the presence of pricing or tolling and the associated choices and alternatives drivers have for either using or avoiding toll facilities.

The updated analysis for this Transportation Discipline Report (TDR) considers the same topics as analyzed in 2006, including travel demand forecasting, regional travel, highway operations and safety performance, arterials and local streets, and freight, but uses more advanced tools such as the DTA model.

Similar to the 2006 document, studies documenting the transportation-related impacts of the proposed corridor include: traffic forecasts, analyses of traffic operations on the freeway, truck transportation analysis, arterial and local street systems, evaluation of transportation safety performance, and bicycle and pedestrian facilities. The project has a limited effect on other modes of transportation, including transit and rail so specific studies of these elements were not required. The discussion of each topic covers the affected environment for the existing year (2016) and the expected potential long-term transportation effects for the horizon year (2045), for both the 2045 No Build and Phase 1 Build conditions.

Traffic Data

Existing transportation conditions were updated from year 2006 to year 2016, and were analyzed using several methods and data sources. The study area for the current analysis is consistent with the study area assessed in the 2006 FEIS. Current traffic volume counts and intersection turning movement data for the study area (Figure 1) were obtained from studies and projects being conducted for the Washington State Department of Transportation (WSDOT), the City of Fife, and the City of Tacoma. Where recent data was not available the project team undertook a data collection effort to fill in the gaps. WSDOT provided mainline and ramp traffic counts for I-5.

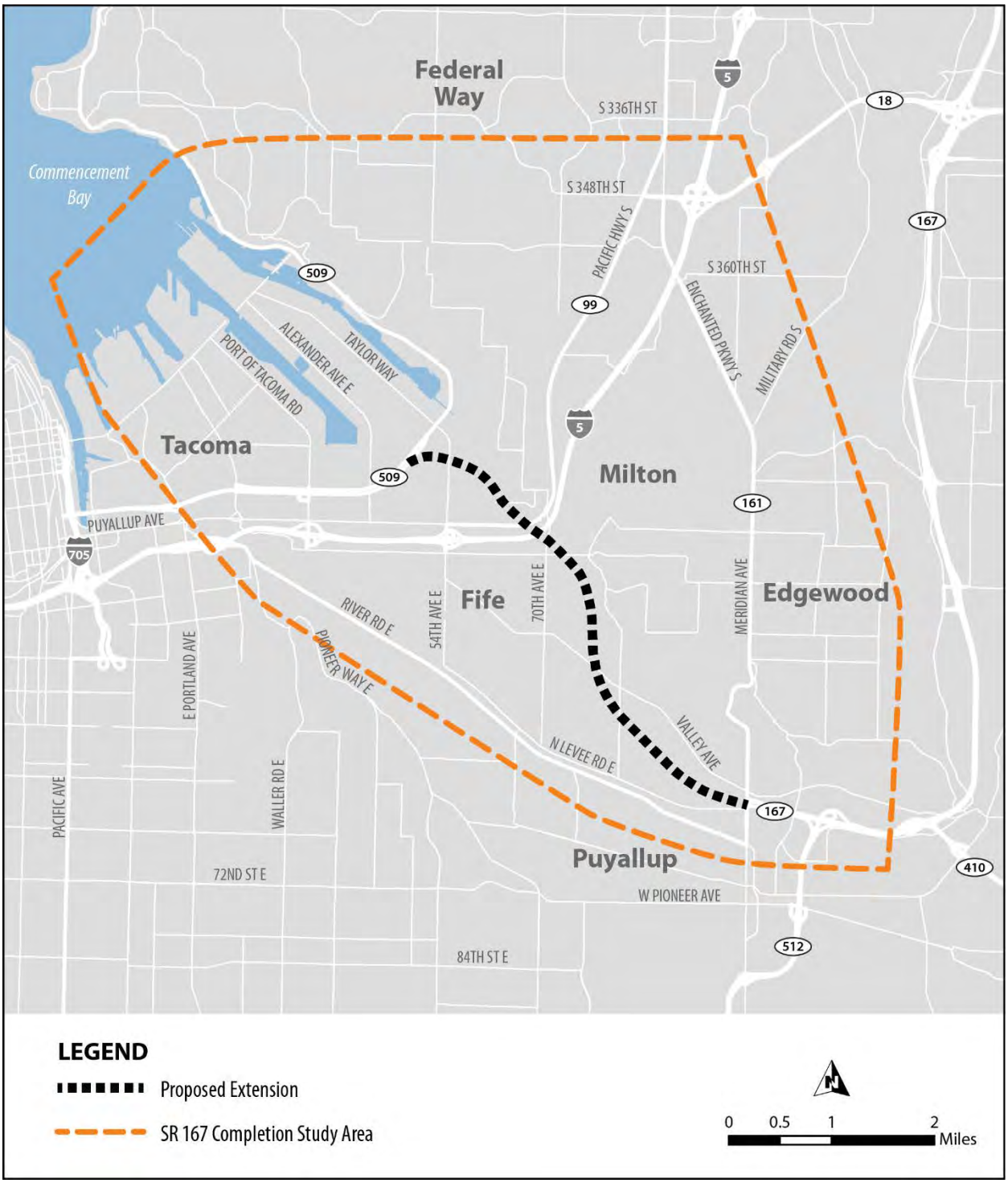


Figure 1. SR 167 Completion Project Transportation Study Area

Traffic Forecasts

Forecast Development

Consistent with the approach taken in the 2006 FEIS, traffic forecasts were developed based on the current Puget Sound Regional Council (PSRC) travel model. However, to refine the forecasts further, an independent review of the most recent land use forecasts was conducted and incorporated into the travel model. Attachment C (*Gateway Program—SR 167 Completion Work Items 2 and Task 4 Deliverables Technical Memorandum*) provides a detailed description of the travel demand model development process.

A further step to develop more refined forecasts for the study area was to utilize a simulation-based DTA model using the Dynameq software to assign future volumes to the study area roadway network. This model blends traffic assignment capabilities with the intersection and link operational analysis characteristics of traffic simulation tools to produce traffic assignments that better reflect likely travel choices under congested conditions. This mesoscopic modeling platform was chosen for the purposes of traffic assignment because it more specifically incorporates corridor-level performance, route and pathway diversion, and the effects of segment-based facility tolling into its traffic assignments. Trips were taken from the current PSRC model and input into the DTA model to produce peak period traffic forecasts for freeways, ramps, and arterial roadways within the study area.

Post-Processing

The intersection traffic volumes were refined based on procedures described in the National Cooperative Highway Research Program Report 765. Imbalances between intersections were addressed through manual adjustments of individual turning movements, or through balancing at mid-block access points.

The raw Dynameq model volumes were adjusted for the 2045 horizon year No Build and Phase 1 Build conditions intersection analysis using two factors: the ratio of the actual 2016 base year traffic count to the base year raw Dynameq model volumes and the numerical difference between the actual base year traffic count and the base year raw Dynameq model volumes.

Future Land Use Projections

To support traffic forecasts, the most recent land use projections forecasts from PSRC were used. These forecasts were refined for the Gateway Program area in order to more accurately reflect intended local jurisdictional allocation of future development. Attachment D (*Land Use Reallocation for Gateway Program Travel Modeling Technical Memorandum*) provides a description of the assumptions used to develop the household and employment land use model forecasts.

2045 Network Assumptions

An updated baseline network for the future (2045) Phase 1 No Build condition was developed from transportation plans for the study area. All environmentally approved and funded projects in the study area that are included in relevant local, regional, and state plans are assumed in the 2045 horizon year. A list of the future transportation projects is included in Attachment E.

For 2045, projects within the State's Connecting Washington Transportation Package are assumed, depending on their published project schedule. In addition, a variety of local projects were assumed from city, county, and state transportation improvement plans (TIPs).

Phase 1 of both the SR 509 Completion project and the SR 167 Completion project are assumed to be complete and operational by year 2030, well in advance of the 2045 horizon year. Beyond roadway projects, tolling is also

assumed for the horizon year 2045 based on current Washington State legislative intent to toll these facilities. Specifics of the assumed tolling parameters are discussed in the Traffic Operations Analysis section below.

Traffic Operations Analysis

Freeway Analysis

A DTA model based on Dynameq software was used to assess current and future freeway conditions. This mesoscopic modeling platform was deemed suitable for the purposes of investigating corridor-level performance, route and pathway diversion, and the effects of segment-based facility tolling because of its blending of traffic assignment capabilities with the intersection/link operational analysis characteristics of traffic simulation tools.

All of the freeway mainline, ramps, ramp terminal intersections, and primary arterials within the study area were included in the Dynameq model. A representation of the study area network is provided in Attachment F, Dynameq Gateway DTA Model Network Map.

A model validation process was performed to demonstrate reasonable replication of existing corridor performance (volumes and travel times) through a series of model calibration adjustments. The goal of the Dynameq model validation process was to compare the outputs and results from the initially developed base year (existing conditions) Dynameq model to observed data sources and adjust the model inputs to strengthen the correlation between model-based and observed data. Several measures were used to validate the Dynameq model, including freeway segment, ramp, and arterial volumes and point-to-point travel times. The outcomes of the model validation demonstrate that the Gateway Dynameq model is able to replicate observed freeway performance and ramp demands reasonably well when model inputs are refined and select link attribute adjustments are incorporated. The model validation process and outcomes are described in further detail in Attachment G, *Dynameq Model Validation Technical Memorandum.*

Tolling Analysis

The 2006 FEIS analysis did not include tolling of the proposed project, whereas the current re-evaluation of the Phase 1 Improvements does include tolling as part of the Build Alternative. The intent of tolling the facility is to manage the traffic demand and maximize the operational efficiency of the corridor as well as pay for a portion of the construction costs. It is assumed that all vehicles will be tolled and time-of-day tolling would be implemented, with higher tolls in the peak periods and lower tolls in the off-peak periods to manage demand. The methodology for assessing the impact of tolls on traffic flows used the traditional approach of converting toll rates to travel time equivalents based on the assumed value of time for a given traveler. This added travel time, or impedance, was then added to the actual travel time estimated for the route in the form of a travel time "penalty." If the actual travel time plus the travel time penalty for using the tolled facility was greater than the travel time incurred while using an alternative route, then the traveler would generally be assigned to the alternative route by the model. Key to determining how much traffic would use a tolled facility versus alternative routes are the assumptions for toll rates on the facility, as well as assumptions for the traveler's value of time. All electronic tolling was assumed, either by transponders or by mail. Pay-by -mail transactions would be subject to a surcharge to cover the cost of the transaction. Ultimately, the Washington State Transportation Commission (WSTC) sets operational hours, user exemptions, occupancy requirements, and operating parameters for tolled facilities. The WSTC will set operational requirements prior to opening day.

Further WSTC action will dictate tolling policy updates. However, it is anticipated that any policy changes would remain consistent with the effects shown in this report because any policy changes will still require demand management to provide a reliable trip to users. For this phase of the Dynameq modeling, relatively low toll rates were used in order to attract a relatively high volume of traffic to the facilities. The toll rates assumed are shown in Table 2.

Table 2. Toll Rate Assumptions

Toll Characteristic or Element	In 2015 dollars
Peak direction	$0.75
Off-peak direction	$0.50
SR 509 Spur both directions	$0.50
Off-peak period	$0.50
Trucks	same as autos

Tolls are not additive across segments within the SR 167 or SR 509 Spur project areas.

Intersection Analysis

Synchro (version 9) was used to analyze traffic congestion at study area intersections. Synchro utilizes industry standard methodologies outlined in the Transportation Research Board's Highway Capacity Manual 2010 (HCM 2010) for isolated intersection analysis.

Intersection performance was measured based on the average seconds of vehicle delay and was reported in terms of level of service, or LOS. This LOS measurement generally describes operating conditions based on a letter-grade system from LOS A to LOS F. LOS A generally represents ideal operating conditions with little to no delay and where movements are not influenced by other vehicles on the roadway. LOS F represents poor operating conditions, including high delays and extreme congestion. For all jurisdictions in the study area, the impact threshold below which improvements need to be made is LOS D. The LOS classifications are defined in HCM 2010.

Safety Performance

Updated crash data for I-5, the existing limited access portion of SR 509 and existing SR 167 within the SR 167 Completion Project study area, including River Road, was provided by WSDOT Olympic Region and represents reported crashes occurring between January 2011 and mid-2016. While the focus of this data review and summary was on the I-5 segment through Fife due to the scale of improvements in this area, crash data for the existing SR 167 and SR 509 segments surrounding the I-5 interchange and mainline segment were also summarized. Relevant corridor segments and interchange area represented include the following:

- I-5 Milepost 135.69 to 139.06 (Mainline and Interchanges)—Fife
- SR 167 Milepost 5.26 to 6.44 (Mainline and Interchanges)—Puyallup
- SR 167 (River Road) MP 0.59 to MP 6.22
- SR 509 Milepost 1.66 to 3.91 (Mainline and Interchange Areas)—Port of Tacoma

A qualitative assessment of the potential safety performance conditions was performed for the future (2045) No Build and Build conditions.

Affected Environment

The project's study area is the same as in the 2006 FEIS and is bounded by the proposed SR 509 Spur/SR 509 interchange to the west, the I-5/SR 18 interchange to the north, the existing SR 167/SR 410 interchange to the southeast, and the I-5/ Port of Tacoma Road Interchange to the southwest as shown in Figure 1.

Existing Freeway Network

The study area is served by I-5, the primary north-south freeway route on the West Coast, and a number of principal, minor and collector streets as shown in Figure 2. I-5 serves as the principal north-south travel corridor in the Puget Sound region. North of the study area, SR 18 provides an important link to I-90 and destinations east.

The southeastern portion of the project study area is served by the SR 512/SR 161 and SR 167 freeways. Both these facilities currently terminate in the vicinity of North Meridian, immediately north of the Puyallup River. The existing SR 167 provides the following connections:

- SR 410 freeway to Bonney Lake
- SR 410 to Yakima via Cayuse/Chinook Pass and/or White Pass
- SR 18 in Auburn connecting to I-90 west of North Bend
- I-405 in Renton

The Auburn to Renton section of the SR 167 freeway serves a major regional distribution and employment center. The SR 512 freeway provides access from Puyallup to I-5 in Lakewood.

Within the SR 167 Completion Project area, I-5 consists of four general purpose travel lanes in each direction plus a northbound HOV lane that begins just north of the Port of Tacoma Road interchange, and a southbound HOV lane that terminates just north of the 54th Avenue East interchange. Interchanges are provided at Portland Avenue/Bay Street (the connection to the existing River Road), Port of Tacoma Road and 54th Avenue East. 70th Avenue East and Porter Way bridges cross over I-5.

I-705 provides a freeway connection between I-5 and downtown Tacoma. It branches off of I-5 west of the Puyallup River, on the western edge of the project area, and extends north with interchanges at South 21st Street, South 15th Street, and South 11th Street.

SR 509 provides east-west access to the Port of Tacoma as well as northeastern Tacoma. Currently, a four-lane facility is in operation from I-705 to Port of Tacoma Road.

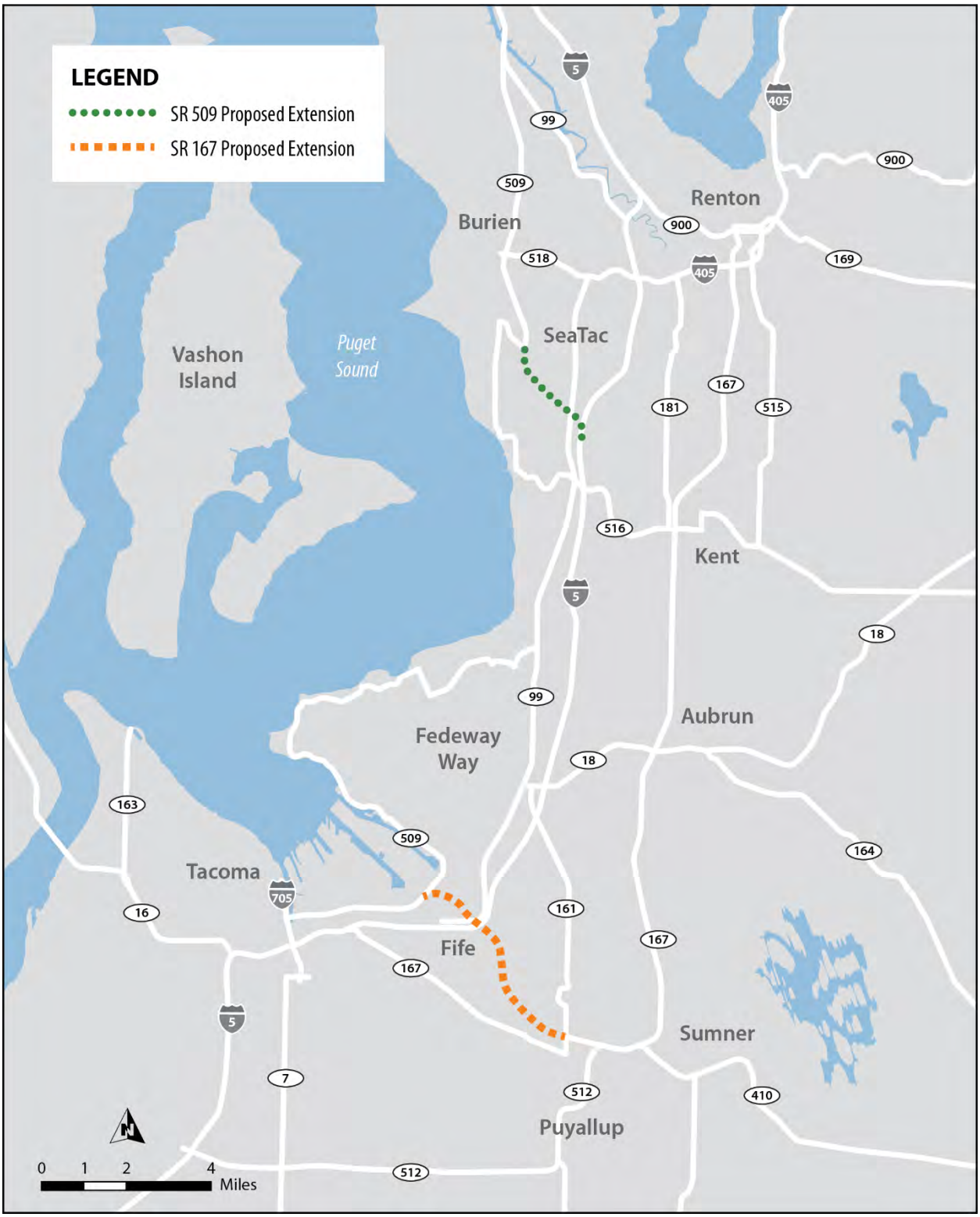


Figure 2. Regional Highway System

Existing Surface Streets

North of I-5, the Port of Tacoma Road and 54th Avenue East/Taylor Way provide relatively direct routes between I-5 and the Port of Tacoma. The arterial network south of I-5 is generally not well developed. Through traffic between the SR 167 and SR 512 freeways and I-5, the Port of Tacoma, and Tacoma central business district areas is routed onto either Valley Avenue or River Road (SR 167). A high percentage of truck traffic from the east is forced to use these routes to access the Port. This traffic, in combination with locally generated traffic, results in high traffic demands on the existing local system.

Non-freeway arterial routes operated by WSDOT include, Pacific Highway (SR 99), River Road (SR 167), and North Meridian Avenue (SR 161).

Phase 1 of the "SR 509 East-West corridor project" built a four-lane freeway from Pacific Avenue to Milwaukee Way back in the 1990s. A subsequent phase of this project extended the four-lane freeway in the parkway median from Milwaukee Way to Taylor Way, however at-grade intersections remain with Alexander Avenue and Taylor Way. Since the Tier II DEIS was published, the City of Tacoma, Pierce County, and Port of Tacoma staff have coordinated the closure of Alexander Avenue north of SR 509, except for local traffic destined for the Evergreen Terminal.

River Road (SR 167) is a five-lane principal arterial, functioning as the link between I-5 in Tacoma and the existing SR 167 freeway near Puyallup. Pacific Highway is a four-lane principal arterial east of 54th Avenue East managed by WSDOT. West of 54th Avenue East, it is a city street owned by the Cities of Fife and Tacoma. North of Valley Avenue East, North Meridian (SR 161) is a two-lane minor arterial that serves as a route to Edgewood and Federal Way from Puyallup.

Principal arterials that are operated by Pierce County or other local jurisdictions include 54th Avenue East, Pacific Highway East, 70th Avenue East, Valley Avenue East, and Port of Tacoma Road. Valley Avenue East is an existing two-lane road between 54th Avenue East and 70th Avenue East, and four lanes between 70th Avenue East and North Meridian. It is a primary connector between the cities of Fife and Puyallup. North of 24th Street East, this route continues as 54th Avenue East, which has been widened to three lanes south of I-5 and five lanes north of I-5, where it provides access to the Port of Tacoma. The principal existing access route to the Port from I-5 is Port of Tacoma Road, a five-lane surface street. The City of Fife recently made capacity improvements to the Port of Tacoma Road/Pacific Highway intersection.

Other locally maintained minor arterial streets within the project area include 20th Street East, 54th Avenue East (south of Valley Avenue), North Levee Road East, and Freeman Road East. These streets are generally two lanes wide. As adjacent land is developed, continuous center two-way left turn lanes have been constructed on these streets; however, numerous gaps remain.

Existing (2016) Traffic Volumes

Selected AM and PM peak hour traffic volumes on the freeways and streets within the project area are listed in Table 3 for the locations depicted on Figure 3. These volumes are based on traffic counts conducted by the jurisdiction operating the various facilities. Where year 2016 data was not available, the traffic volumes were estimated by applying growth factors to earlier counts.

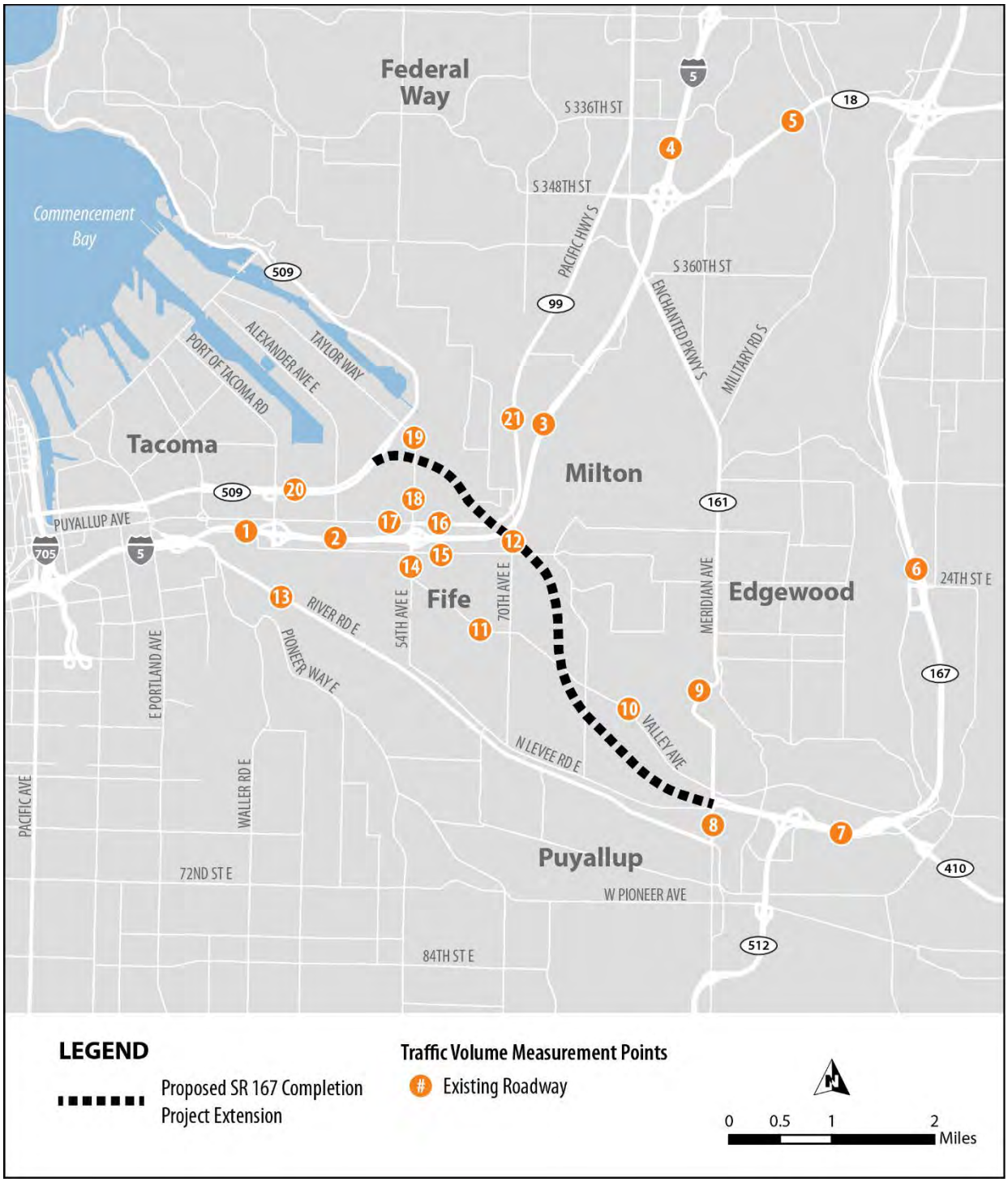


Figure 3. Locations for Traffic Volume Measurement Points

Table 3. Existing Peak Hour Volumes for Study Area Roadways

Measurement Point	Location	Direction	AM Peak Hour	PM Peak Hour
1	I-5 south of Port of Tacoma Road	NB	6490	6030
		SB	6050	6540
		Total	12780	13510
2	I-5 north of Port of Tacoma Road	NB	6240	5730
		SB	6370	5760
		Total	12610	11490
3	I-5 north of the Fife Curve (south of SR 18)	NB	6390	5870
		SB	6370	5240
		Total	11630	10990
4	I-5 north of SR 18	NB	5970	5430
		SB	4900	6800
		Total	11030	12060
5	SR 18 west of Military Road	EB	3450	3160
		WB	3560	3720
		Total	7240	7450
6	SR 167 north of 24th Street E	NB	2900	2650
		SB	2160	2990
		Total	5820	6690
7	SR 167 north of SR 512	NB	2208	2010
		SB	1550	2040
		Total	6380	6690
8	Meridian Avenue south of N Levee Road	NB	1320	1420
		SB	1050	1830
		Total	2370	3250
9	SR 161 south of 43rd Street Ct E	NB	500	160
		SB	140	240
		Total	640	400
10	Valley Avenue east of Freeman Road	EB	430	870
		WB	650	430
		Total	1080	1300
11	Valley Avenue west of 70th Avenue	EB	310	630
		WB	660	470
		Total	970	1100
12	70th Avenue E north of 20th Street E	NB	360	280
		SB	350	610
		Total	710	890
13	River Road (SR 167) east of 30th Avenue E	EB	690	1210
		WB	1230	1020
		Total	1920	2230
14	54th Avenue E south of 20th Street E	NB	750	520
		SB	400	700
		Total	1150	1220
15	20th Street E east of 54th Avenue E	EB	360	660
		WB	620	760
		Total	980	1420

Measurement Point	Location	Direction	AM Peak Hour	PM Peak Hour
16	Pacific Highway (SR 99) east of 54th Avenue E	EB	1070	840
		WB	510	1110
		Total	1580	1950
17	Pacific Highway (SR 99) west of 54th Avenue E	EB	760	1080
		WB	620	1210
		Total	1380	2290
18	54th Avenue E north of Pacific Highway (SR 99)	NB	510	450
		SB	420	640
		Total	930	1090
19	Taylor Way east of SR 509	NB	410	610
		SB	520	590
		Total	930	1200
20	SR 509 east of Port of Tacoma Road	EB	1290	1170
		WB	820	1830
		Total	2110	3000
21	Pacific Highway (SR 99) north of Porter Way	NB	1020	720
		SB	410	1470
		Total	1430	2190

Suggest adding footnote for locations 22-25, per see previous comment

Roadway Capacity

Most of the existing capacity restrictions are in the vicinity of principal arterial intersections or freeway interchanges. Freeway mainline and interchange operations as well as key intersections on the surface street system are explained below.

Freeways

Peak Period Congestion and Queues

Temporal speed maps (see sidebar) are used to illustrate operational conditions on I-5. These charts, which graphically summarize operational conditions in terms of speeds, time and location, were not were not included in the 2006 FEIS because they were not easily available. However, they are used here because they provide higher resolution of freeway performance. Figure 4 presents the existing AM temporal speed data of northbound I-5. As shown, congestion begins early, i.e., before 6:00 AM, at the southern end of the corridor on the south side of the Puyallup River and extends through the Port of Tacoma Road and 54th Avenue E interchanges. The congestion, due to the constraints of the Puyallup River Bridge, on-going project construction in the corridor, as well as the merging and lane changing activity that occurs between the I-705, Portland Avenue and Port of Tacoma interchanges, lasts throughout the AM peak period, though it begins to subside somewhat after 8:00 AM. Construction activities between SR 16 and the Puyallup River crossing also adds to the current congestion in this stretch. A northbound HOV lane begins as an added lane to I-5 north of the Port of Tacoma Road interchange which helps alleviate congestion to some degree. The other notable morning slowdowns generally occur south of SR 18 between 6:30 and 8:00 AM and is likely due to high volumes exiting to SR 18 and Federal Way, which slows down the right mainline lanes.

Temporal Speed Maps

The existing conditions temporal speed maps were created from 2015 WSDOT loop detector occupancy data for the GP lanes. The maps summarize the existing speeds on I-5 by peak direction and time of day, where, red, pink, blue and black represent slow congested conditions or LOS F (approximately 40 mph or less), while yellow and green represents moderate to high speeds and LOS E or better (40 mph or higher) operating conditions. The off-peak directions of I-5 (AM southbound and PM northbound) are not shown because they operate much better than the peak directions shown.

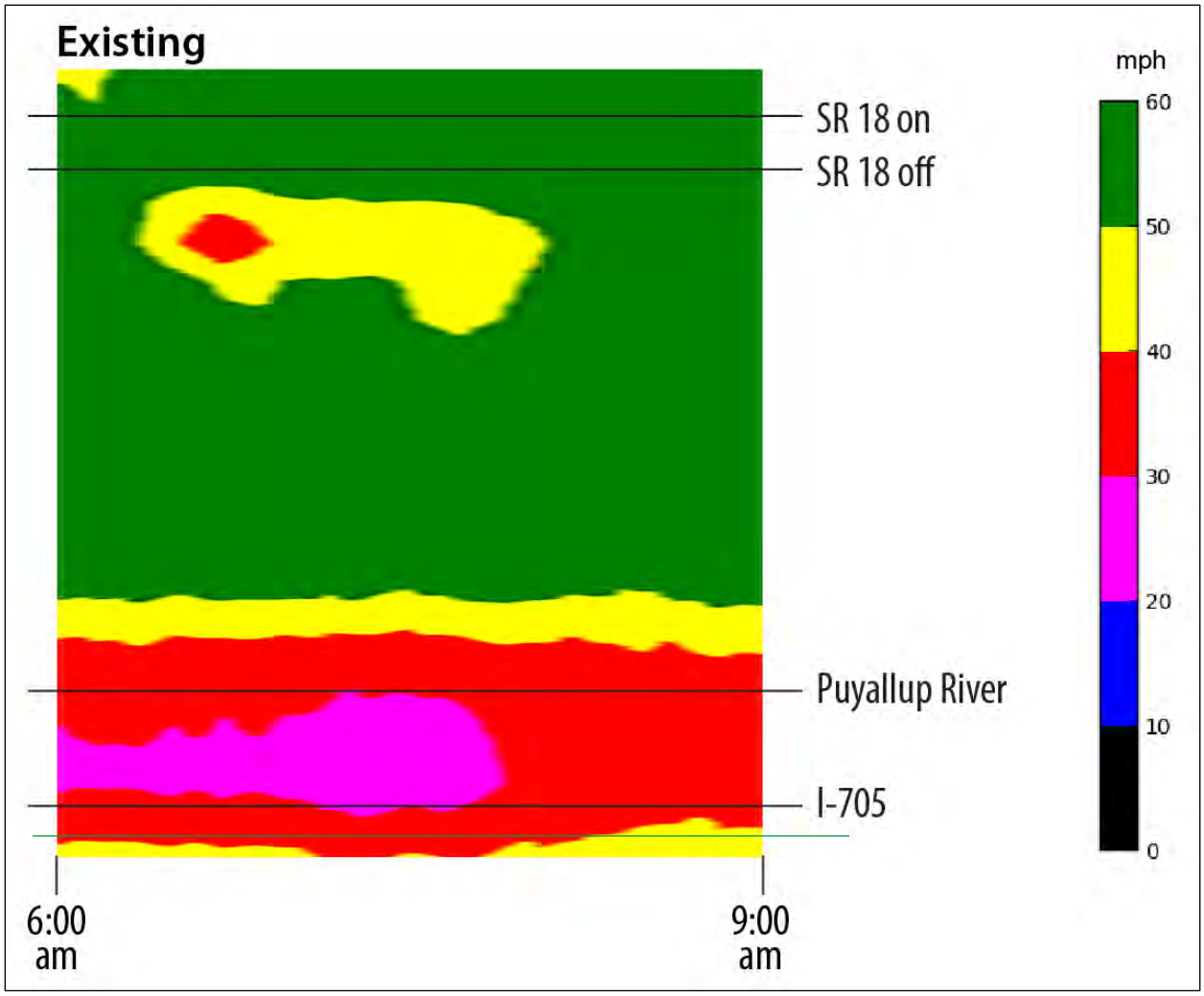


Figure 4. Existing (2016) AM I-5 Northbound Speed Temporal Chart

Figure 5 presents the existing PM temporal speed data of southbound I-5. As shown, PM peak period congestion in the peak direction is more substantial than AM and generally extends the length of the study corridor. Southbound congestion typically emanates from the Port of Tacoma Road and 54th Avenue interchange areas south of the "Fife curve"[1] and stretches back to the SR 18 interchange area, with the heaviest congestion occurring between 4 and 6 PM. The southbound I-5 mainline also reduces from a five-lane to a four-lane cross-section at the 54th Avenue interchange, which constrains the capacity of the mainline and contributes to congestion

[1] Area just east of 54th Ave. E. and 70th Ave E where I-5 goes from an east-west to a north-south facility.

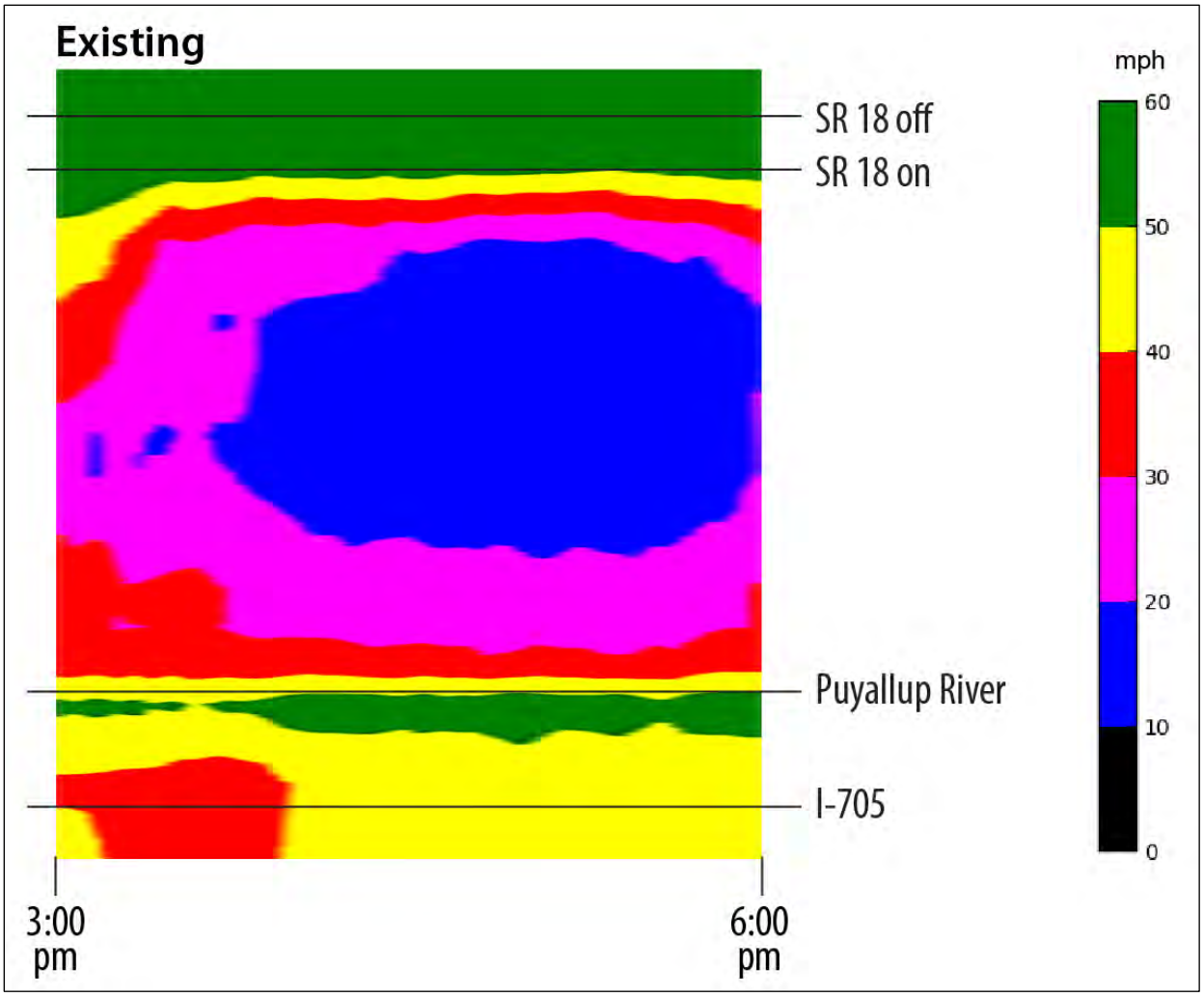


Figure 5. Existing (2016) PM I-5 Southbound Speed Temporal Chart

Peak Period Average Speeds

Peak period average speeds on I-5 through the study area, and SR 167 between Meridian Avenue and SR 410 are shown in Table 4. Average speeds on I-5 are lower in the peak directions (AM northbound (47 mph) and PM southbound (40 mph)) than in the off-peak directions (AM southbound (greater than 55 mph) and PM northbound (52 mph)). The southbound PM peak slowdowns are consistent with the speed temporal chart, which indicates a back-up emanating from the Port of Tacoma Road and 54th Avenue E interchanges.

Average speeds on SR 167 are over 50 mph northbound in both the AM and PM peak periods as traffic transitions from an arterial environment to a freeway facility east of Meridian Avenue. However, the average speeds in the reverse direction are generally slower in both peak periods due to a combination of added traffic from SR 410 and SR 512, as well as the termination of the existing SR 167 freeway facility at Meridian Avenue.

Table 4. Existing Peak Period Average Speeds from Dynameq Model (mph)

Roadway Segments	AM Peak Period (6:00 9:00 AM)		PM Peak Period (3:00 6:00 PM)	
	NB/EB	SB/WB	NB/EB	SB/WB
I-5 through study area (SR 705 to SR 18)	47	55+	52	40
SR 167, SR 161 to SR 410	52	44	51	44

Notes: The Dynameq modeled speeds on I-5 are an average of both the general purpose and HOV lanes.

Peak Period Travel Times

Peak period travel times were calculated for selected trips between key regional centers and other representative origin\destination locations as indicated by the paths shown in Figure 6. Table 5 lists the estimated peak period travel times along these paths for all vehicle types combined (including SOVs, HOVs, and trucks). Travel times along paths that use I-5 are typically longer in the peak direction (AM northbound and PM southbound) due to congested conditions.

Table 5. Existing Peak Period Travel Times from Dynameq Model (minutes)

Travel Paths		AM Peak Period (6:00 9:00 AM)		PM Peak Period (3:00 6:00 PM)	
ID #	Path Description	NB/EB	SB/WB	NB/EB	SB/WB
1	Through study area on I-5	11	8	10	12
2	Puyallup to north of SR 18	19	18	17	18
3	Port of Tacoma to Sumner/Pacific MIC	21	22	23	22
4	Port of Tacoma to SR 18	13	13	13	14
5	Port of Tacoma to Puyallup	17	17	21	18

Travel time paths are depicted graphically in Figure 6

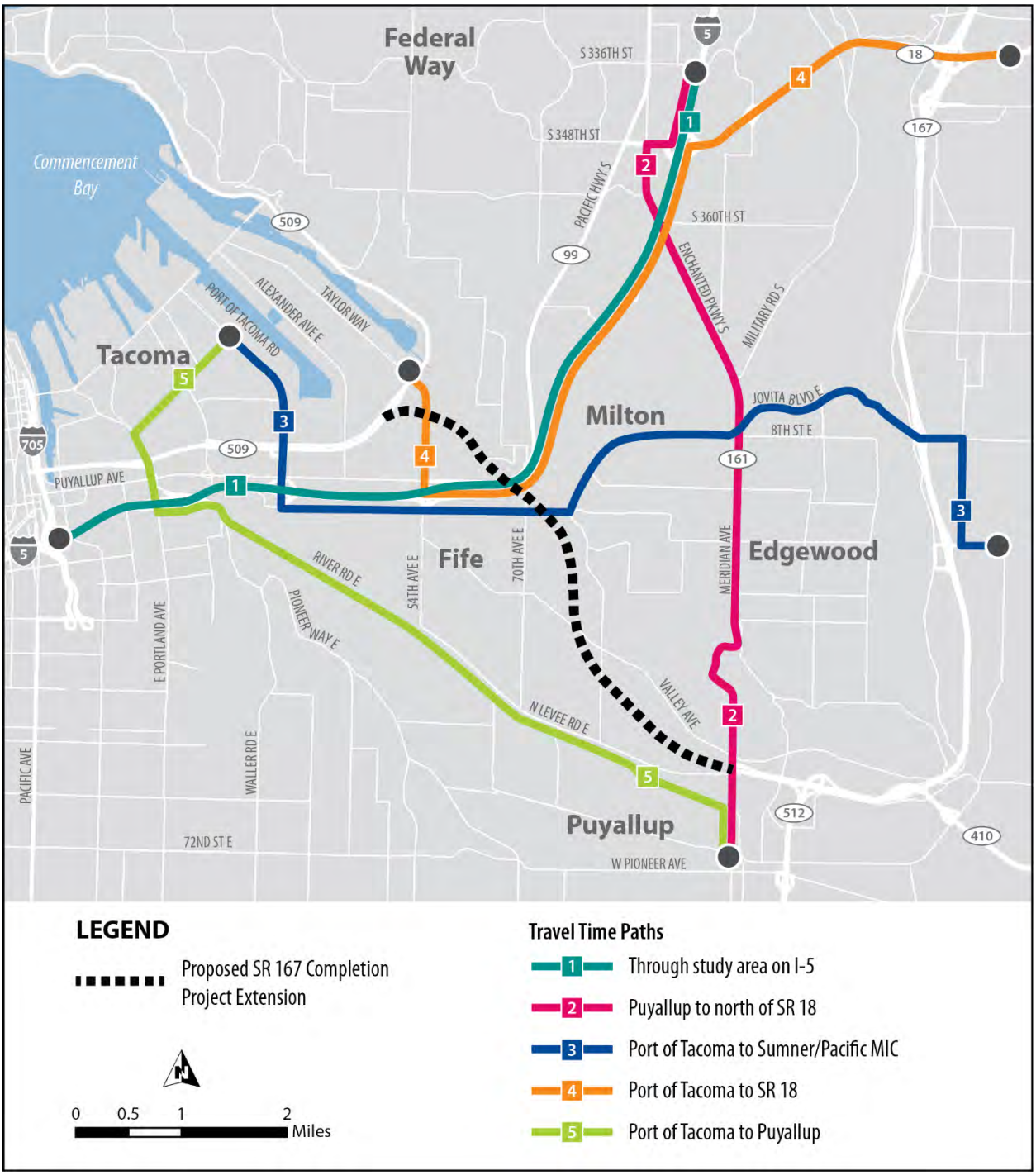


Figure 6. Travel Time Paths Measured in Dynameq Model

Surface Streets

The capacity of the local roadway system is generally controlled by both signalized and unsignalized intersections. Those intersections nearest existing interchanges on I-5 and at the terminus of the freeway section of SR 167 experience the highest levels of peak-period traffic demands near or over their capacity. Table 6 lists existing (year 2016) AM and PM peak hour operations at 36 key intersections in the study area whose locations are shown in Figure 7. Existing traffic counts determined that the actual peak hour differed between intersection locations, but was generally around 7:00 to 8:00 AM for the morning peak, and 4:30 to 5:30 PM for the afternoon peak. The level of service (LOS) threshold below which operations are not considered acceptable is LOS D for all of the jurisdictions in which these intersections are located. As shown, the majority of the intersections are operating above the LOS standard (27 intersections during the AM peak hour and 24 intersections during the PM peak hour). In the AM peak hour, five intersections operate at the LOS standard and three intersections operate below the LOS standard. The Port of Tacoma Road/SR 99 (Pacific Hwy) intersection and the 54th Avenue E/I-5 northbound ramps operate at LOS E in the AM peak due to high traffic volumes, high percentage of slower moving trucks, and for the former, back-ups from the closely spaced intersection of Port of Tacoma Road/Southbound I-5 Ramps. The intersection of River Road/66th Street operates at LOS F in the AM peak hour.

Overall operations are generally worse in the PM peak hour, with four intersections operating at the LOS D standard and nine operating below the LOS standard.

The existing connection between SR 161 and I-5 is on surface streets through the City of Puyallup via North Meridian and River Road. And while the northbound span of the SR 161/SR 167 bridge over the Puyallup River was recently replaced, several intersections along the route operate at or below the LOS threshold during peak periods often resulting in traffic backups and delays. High traffic volumes on River Road result in poor levels of service for traffic turning out of side streets, particularly at higher-volume locations such as the intersection of River Road and 66th Avenue E.

An alternate route from SR 161 to I-5 winds through Fife via Valley Avenue and 54th Avenue East. The proximity of intersections on 54th Avenue East near I-5 combined with high truck volumes, high turning volumes, and inadequate lane configurations, result in delays for traffic passing through these intersections. The intersection at 54th Avenue East and Pacific Highway (SR 99) operates at LOS D in the AM peak hour and LOS E in the PM peak hour. The intersection of 54th Avenue East and 20th Street East operates at a LOS D in both peak hours.

The City of Fife has made capacity improvements to 54th Avenue East and Valley Avenue, including widening Valley Avenue to four lanes between Freeman Road and 70th Avenue East. The City of Puyallup has widened Valley Avenue to four lanes between SR 161 and Freeman Road.

Intersections in the vicinity of the Port of Tacoma Road interchange on I-5 are similarly experiencing traffic demands near or greater than their capacity. The intersection of Port of Tacoma Road and SR 99 operates at LOS E in the AM and LOS F in the PM peak hours respectively. WSDOT has made several attempts to improve operations with signal timing adjustments, but traffic volumes are continuing to increase. The high volume of trucks that use the interchange further add to this problem.

Other intersections that operate below the LOS threshold level in the PM peak hour include Alexander Road at Southbound SR 509, 54th Avenue E at 4th Street E, and the 70th Avenue East intersections with 20th Street and Levee Road.

Table 6: Intersection Peak Hour Level-of-Service—Existing Conditions

Int. #	Location		Intersection Type	Existing Conditions	
				AM	PM
1	Port of Tacoma Rd	20th Ave	Stop-controlled	A	A
2	Port of Tacoma Rd	NB I-5 on/off ramp	Yield-controlled	A	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	B	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	E	F
5	Port of Tacoma Rd	NB SR 509/12th St E	Signalized	B	B
6	Port of Tacoma Rd	N Frontage Rd (SB SR 509)	Signalized	B	B
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	B	B
8	Alexander Ave	NB SR 509	Signalized	C	C
9	Alexander Ave	SB SR 509	Signalized	C	F
10	54th Ave	Valley Ave	Signalized	B	A
11	54th Ave	23rd St	Signalized	A	A
12	54th Ave	20th St	Signalized	D	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	E	E
14	54th Ave	SB I-5 on/off ramp	Signalized	C	C
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	D	E
16	54th Ave	12th St	Signalized	A	A
17	54th Ave	8th St	Signalized	A	A
18	54th Ave	4th St	Stop-controlled	A	A
19	54th Ave	SR 509/Taylor Way	Signalized	D	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	C	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	D	C
22	70th Ave	20th Ave	Signalized	C	E
23	70th Ave	Valley Ave	Signalized	C	D
24	70th Ave	North Levee Rd	Stop-controlled	A	E
25	Pioneer Way	WB SR 512	Signalized	B	B
26	Pioneer Way	EB SR 512	Signalized	A	A
27	66th St	River Rd E (SR 167)	Signalized	F	E
28	66th St	North Levee Rd	Stop-controlled	D	B
29	Freeman Rd	20th Ave/Yuma St	Signalized	B	C
30	Freeman Rd	Valley Ave	Signalized	B	C
31	82nd Ave	North Levee Rd	Stop-controlled	A	A
32	N Meridian Ave	River Rd E (SR 167)	Signalized	C	C
33	N Meridian Ave	4th St NE	Stop-controlled	A	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	A	A
35	N Meridian Ave	SR 167	Signalized	D	D
36	N Meridian Ave	Valley Ave	Signalized	C	D
37	34th Ave	20th Ave	Future Signal	N/A	N/A
38	34th Ave	SR 99 (Pacific Hwy)	Future Signal	N/A	N/A
39	54th Ave	SR 167	Future Signal	N/A	N/A
40	SR 99 (Pacific Hwy)	70th Ave	Future Signal	N/A	N/A
41	Valley Ave	SR 167 NB Ramps	Future Signal	N/A	N/A
42	Valley Ave	SR 167 SB Ramps	Future Signal	N/A	N/A
43	SR 167	NB I-5 Ramp	Future Signal	N/A	N/A
44	SR 167	SB I-5 Ramp	Future Signal	N/A	N/A

Notes: Yellow shading indicates intersection operates at LOS standard (LOS D), while red shading indicates intersection operates below LOS standard (LOS E or F).

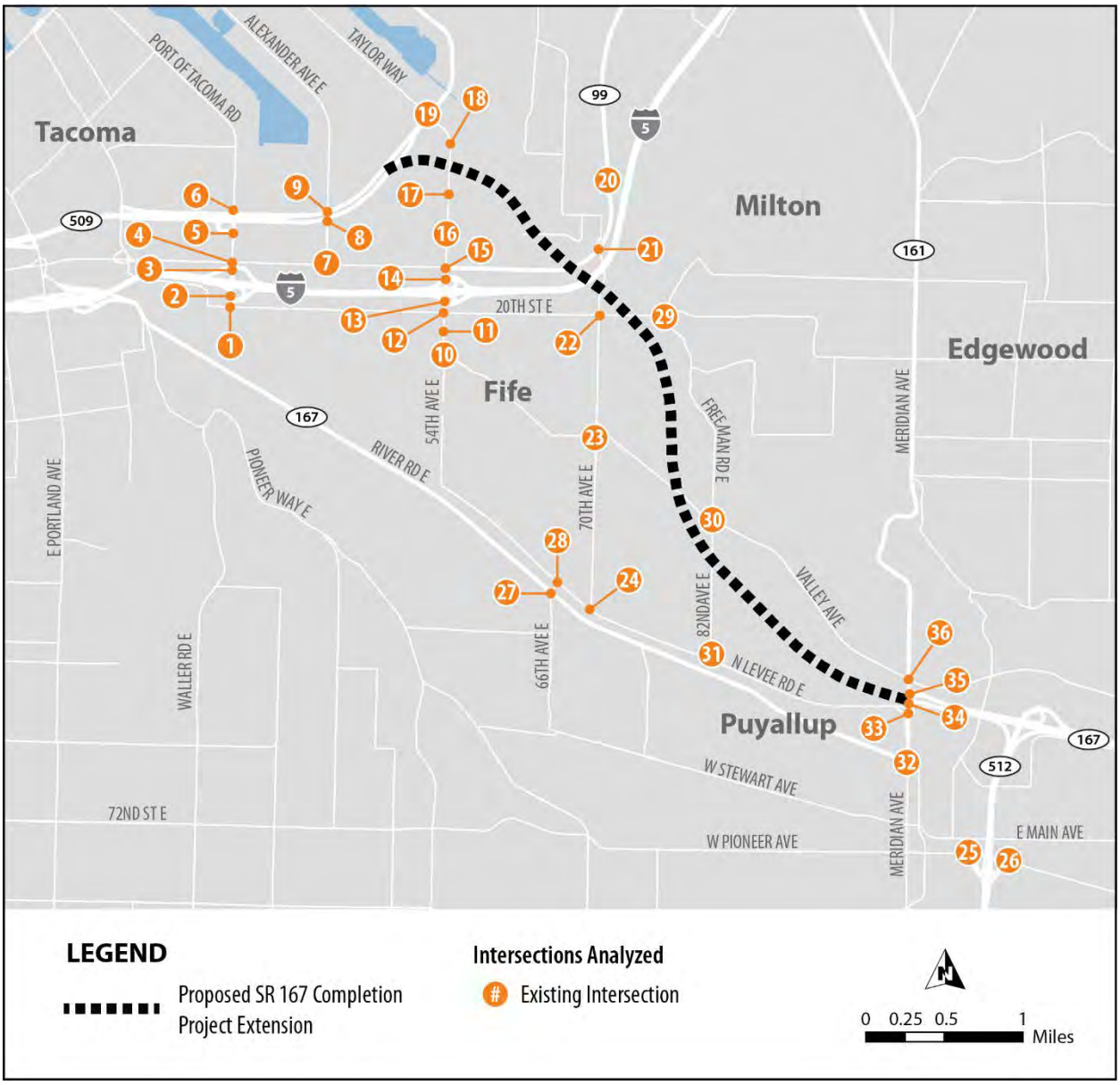


Figure 7. Locations of Intersections Analyzed

Transportation Safety Performance

The SR 167 Corridor Adoption (Tier I) FEIS and SR 167 Puyallup to SR 509 Tier II FEIS accident data analysis reflected the safety performance conditions on the existing freeway and local street system. As identified in the previous efforts, severe congestion and inadequate intersection geometry on both networks contributed to areas with high accident rates. The primary focus of WSDOT's Target Zero campaign is on the reduction and elimination of fatal and serious injury crashes A current safety performance assessment is documented below.

Crash Analysis

A crash density plot (crashes per square mile) depicting all crashes (individually) on I-5 and on selected segments (primarily freeway sections) of SR 167 and SR 509 based on a localized crash analysis is shown in Figure 8. A cluster map showing more aggregated groupings of crashes within the study area is provided in Figure 9. These figures indicate a fairly even distribution of crashes along the I-5 freeway segment through Fife as well as distinct groupings of crashes at interchange areas such as I-5 at 54th Ave E and on SR 167 at Meridian Avenue (SR 161) in Puyallup.

Crashes on I-5, SR 509, SR 167 and SR 161 were also categorized by year, type and direction as shown in Table 7, Table 8, Table 9, Table 10 and Table 11, respectively. The summaries indicate a large proportion of rear end crashes on I-5, which is typical of highly congested freeway segments, especially during peak weekday traffic periods. In terms of year-over-year growth in total crashes, a clear upward trend in the data is observed for all facilities assessed, with the most extreme being the approximate doubling of total crashes on I-5 from 2012-2017. This trend appears particularly pronounced when the crash data is represented in bar chart form (see Figure 10, Figure 11, Figure 12, Figure 13 and Figure 14). Based on the data, the number of crashes along the subject I-5 segment and the other state routes have been growing at a rate of 5-10 percent over the last several years.

Based on the observations along I-5 mainline, more than 59 percent of crashes are rear end, followed by sideswipes (21 percent), fixed object (13 percent), and “other” crashes (7 percent).

Along SR 509, the majority of the accidents are “other” crashes (42 percent) followed by rear end (33 percent), sideswipe (13 percent), fixed object (11 percent), and opposite direction (1 percent).

On the freeway portion of existing SR 167 investigated, the data indicates that approximately half of all crashes are rear end (51 percent) followed by “other” crashes (21 percent), sideswipe crashes (14 percent), opposite direction crashes (8 percent), fixed object (5 percent), and vehicle overturned (1 percent).

Along the short stretch of SR 161 for which data was collected, the most common types of accidents were rear end (37 percent), and sideswipe (34 percent), “other” crashes (22 percent), opposite direction (5 percent), and fixed object (2 percent).

On the River Road portion of existing SR 167 investigated, the data indicates that nearly half of all crashes are rear end (43 percent) followed by “other” crashes (25 percent), fixed object (12 percent), side swipe (9 percent), opposite direction (9 percent), and vehicle overturned (1 percent).

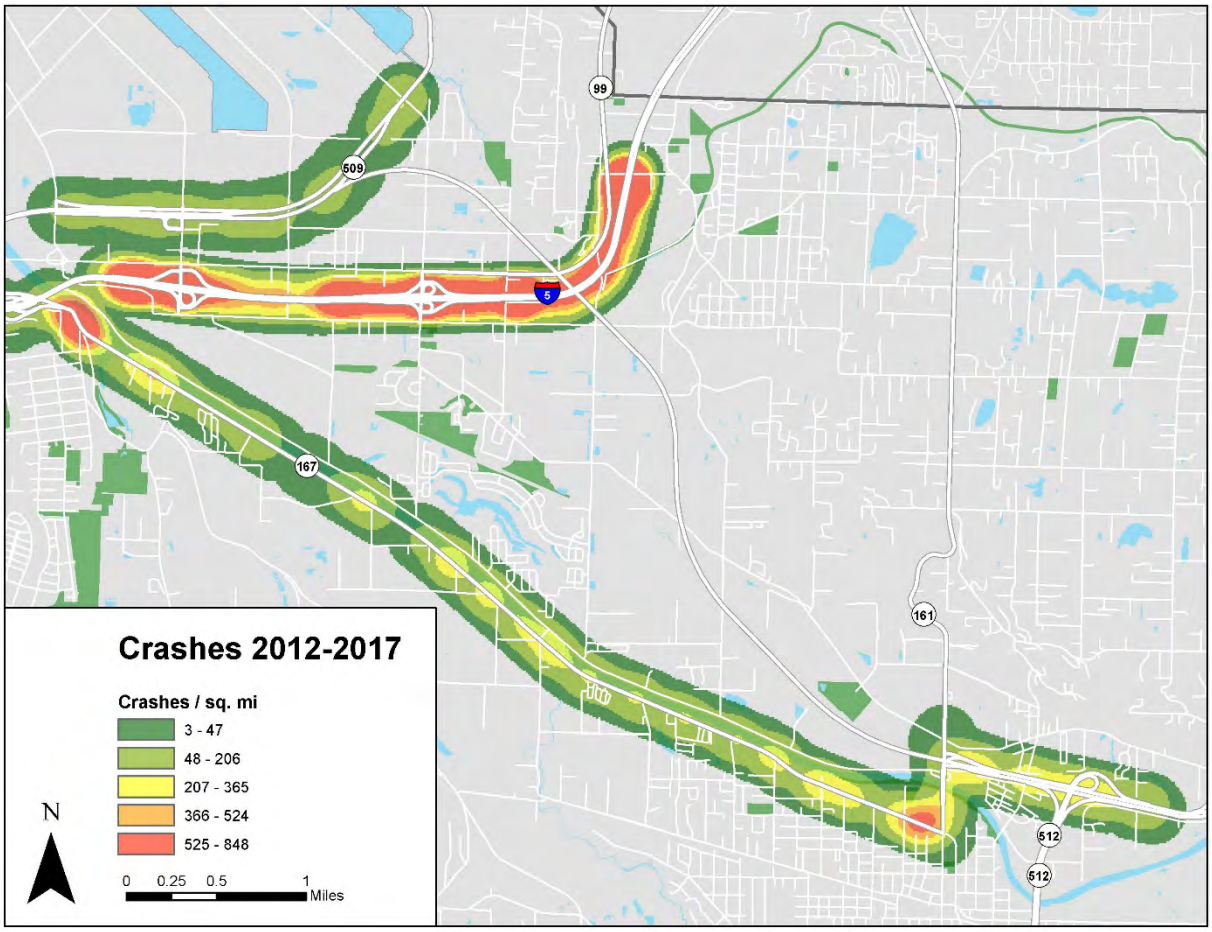


Figure 8. Crash Density Plot

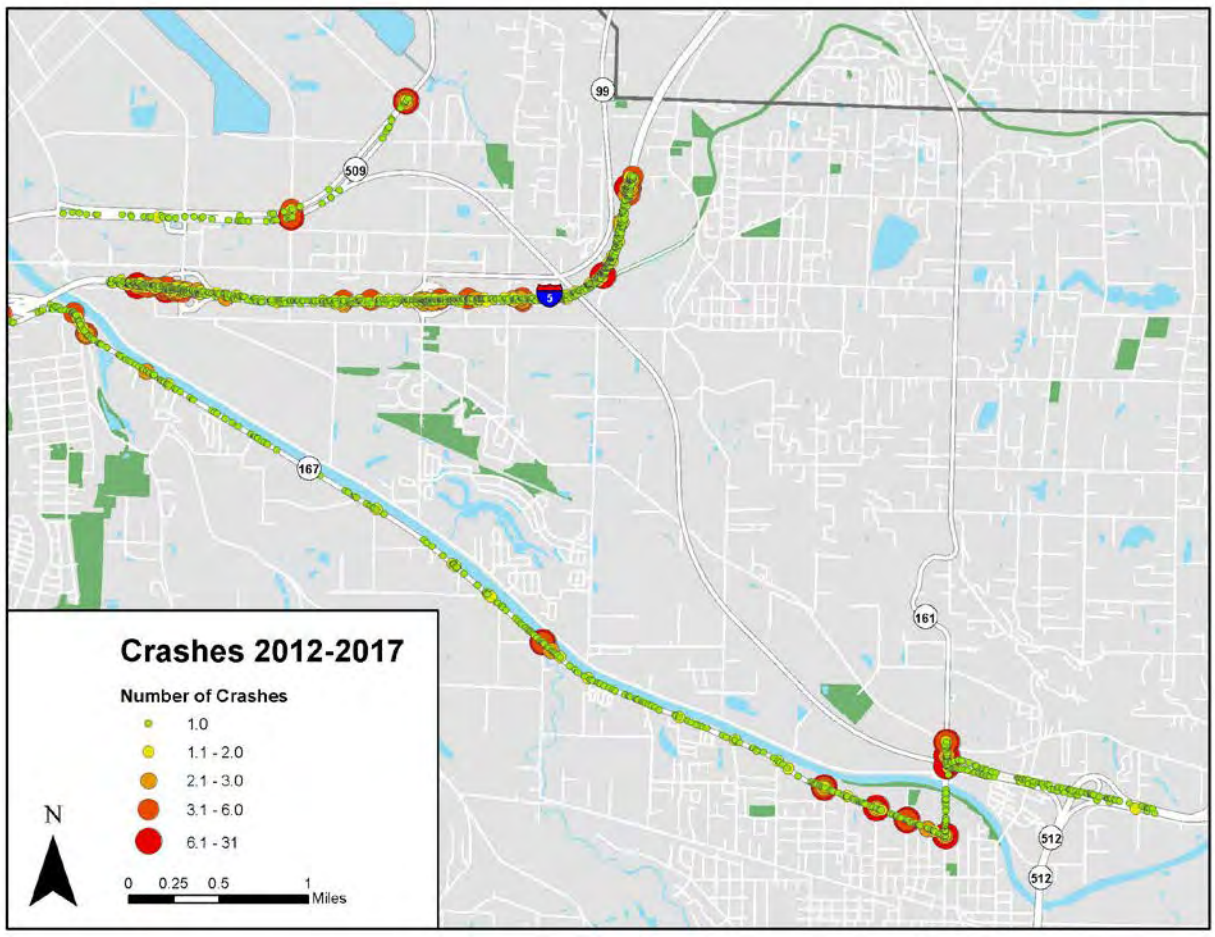


Figure 9. Crash Data Cluster Plot

Table 7. Crashes on I-5 Mainline (Fife) MP 135.69 to MP 139.06 by Year/Type

Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012	1	0	27	97	27	3	0	16	170
2013	1	0	26	112	48	3	0	18	207
2014	1	1	33	119	46	1	0	15	214
2015	2	0	27	157	59	3	1	19	266
2016	4	3	53	204	81	2	0	20	360
2017	1	0	35	235	70	0	0	17	357
2012–2017	10	4	201	924	331	12	1	105	1,574

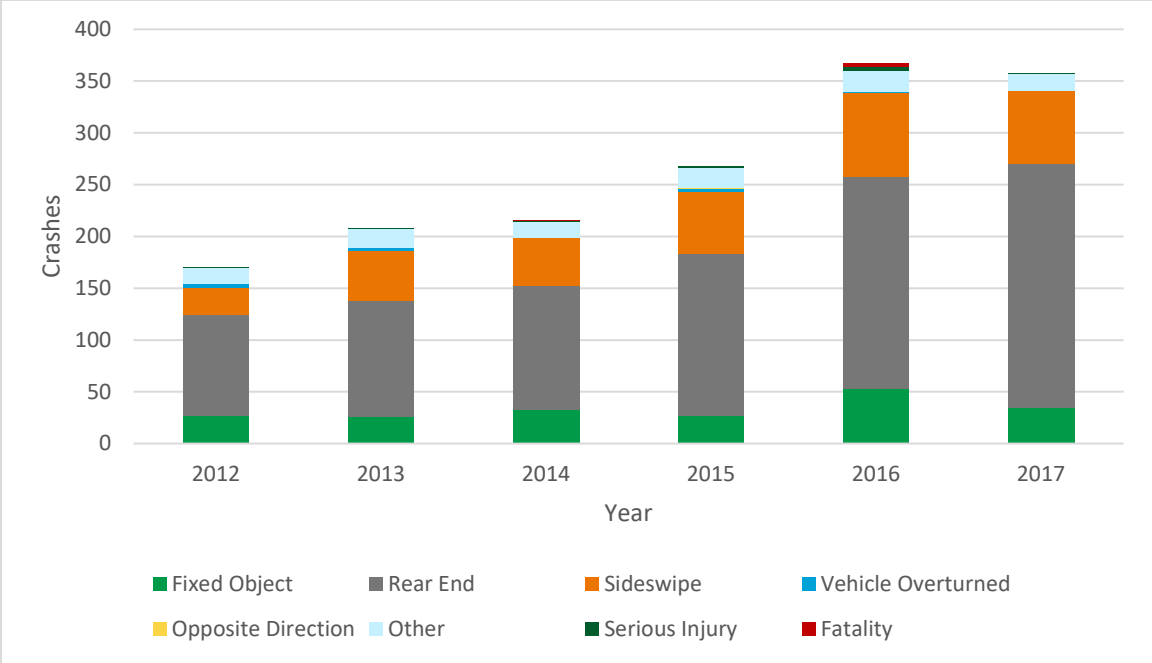


Figure 10. Crashes on I-5 Mainline (Fife) MP 135.69 to MP 139.06 by Year/Type

Table 8. Crashes on SR 509 Mainline MP 1.66 to MP 03.91 by Year/Type

Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012	1	0	1	13	5	0	0	18	37
2013	0	0	2	5	4	0	0	12	23
2014	0	0	3	13	5	1	0	10	32
2015	1	0	5	11	3	0	0	9	28
2016	0	0	7	12	5	0	1	18	43
2017	0	0	4	13	4	0	2	19	42
2012–2017	2	0	22	67	26	1	3	86	205

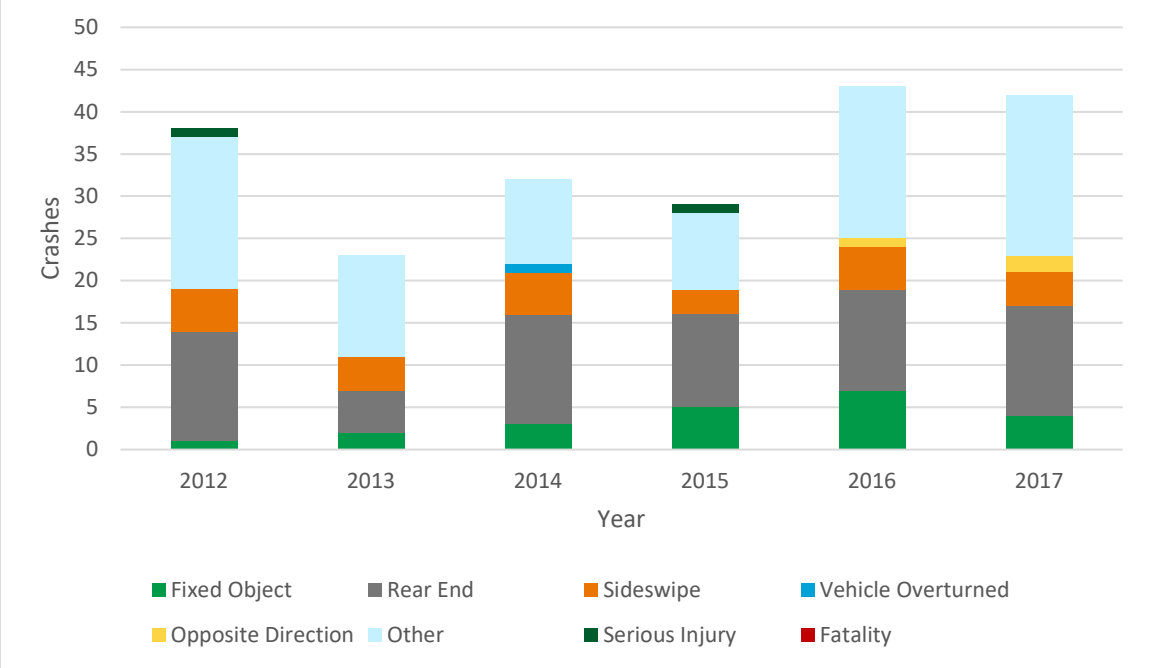


Figure 11. Crashes on SR 509 Mainline MP 1.66 to 3.91B by Year/Type

Table 9. Crashes on SR 167 Mainline MP 5.26 to MP 6.44 by Year/Type

Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012	0	0	1	44	10	1	5	16	77
2013	3	0	5	34	11	1	14	14	79
2014	1	1	4	44	9	1	6	18	82
2015	0	0	2	48	13	0	6	22	91
2016	2	1	5	56	19	1	12	21	114
2017	1	0	9	47	11	1	2	22	92
2012–2017	7	2	26	273	73	5	45	113	535

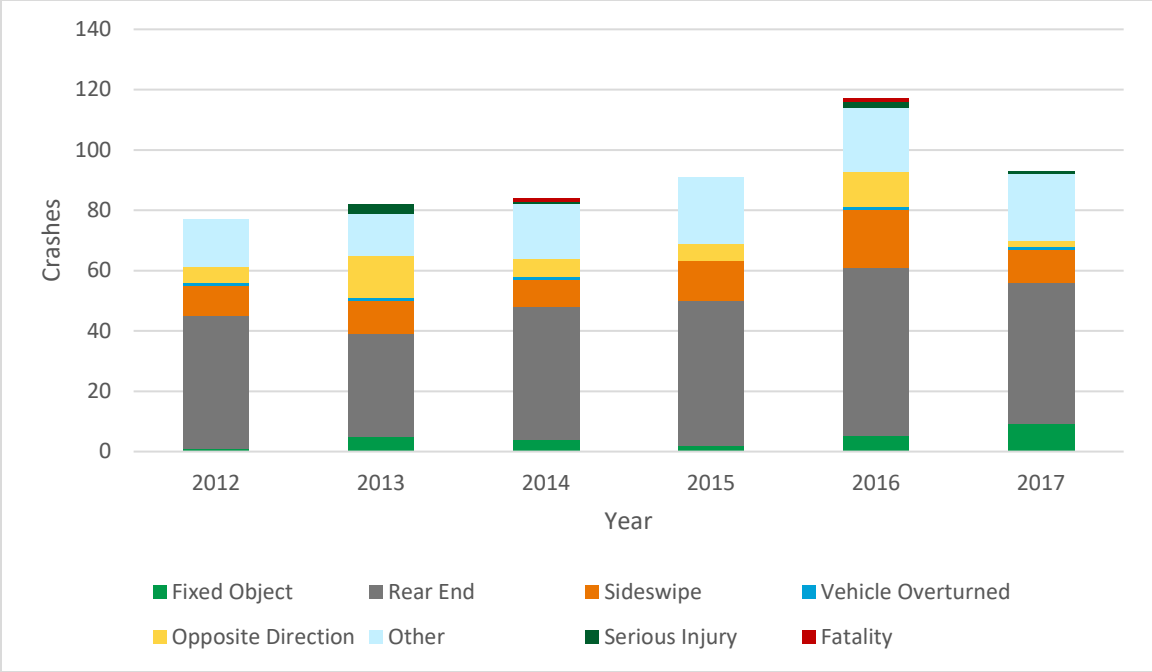


Figure 12. Crashes on SR 167 Mainline MP 5.26 to MP 6.44 by Year/Type

Table 10. Crashes on SR 167 (River Road) MP 0.59 to MP 6.22B by Year/Type

Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012	5	2	9	21	6	0	5	19	60
2013	3	0	5	35	6	3	4	15	68
2014	2	1	8	26	9	2	7	17	69
2015	0	0	8	38	5	0	9	25	85
2016	2	1	9	37	6	0	4	22	78
2017	2	1	9	21	7	1	9	6	53
2012–2017	14	5	48	178	39	6	38	104	413

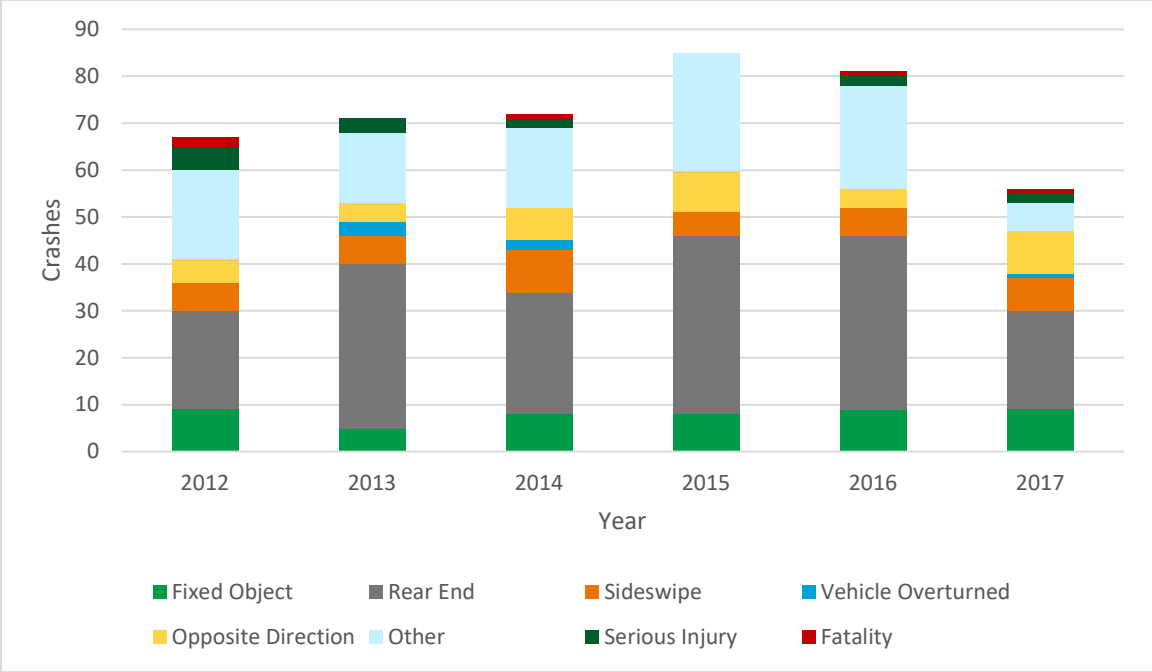


Figure 13. Crashes on SR 167 (River Road) MP 0.59 to MP 6.22B by Year/Type

Table 11. Crashes on SR 161 (Meridian Ave E) MP 29.87 to MP 30.04 by Year/Type

Year	Serious Injury	Fatality	Fixed Object	Rear End	Sideswipe	Vehicle Overturned	Opposite Direction	Other	Total Crashes
2012	0	0	0	5	7	0	0	1	13
2013	0	0	0	8	3	0	1	5	17
2014	1	0	1	5	5	0	0	7	18
2015	0	0	1	9	10	0	2	2	24
2016	0	0	0	11	8	0	2	7	28
2017	0	0	0	8	10	1	1	6	26
2012–2017	1	0	2	46	43	1	6	28	126

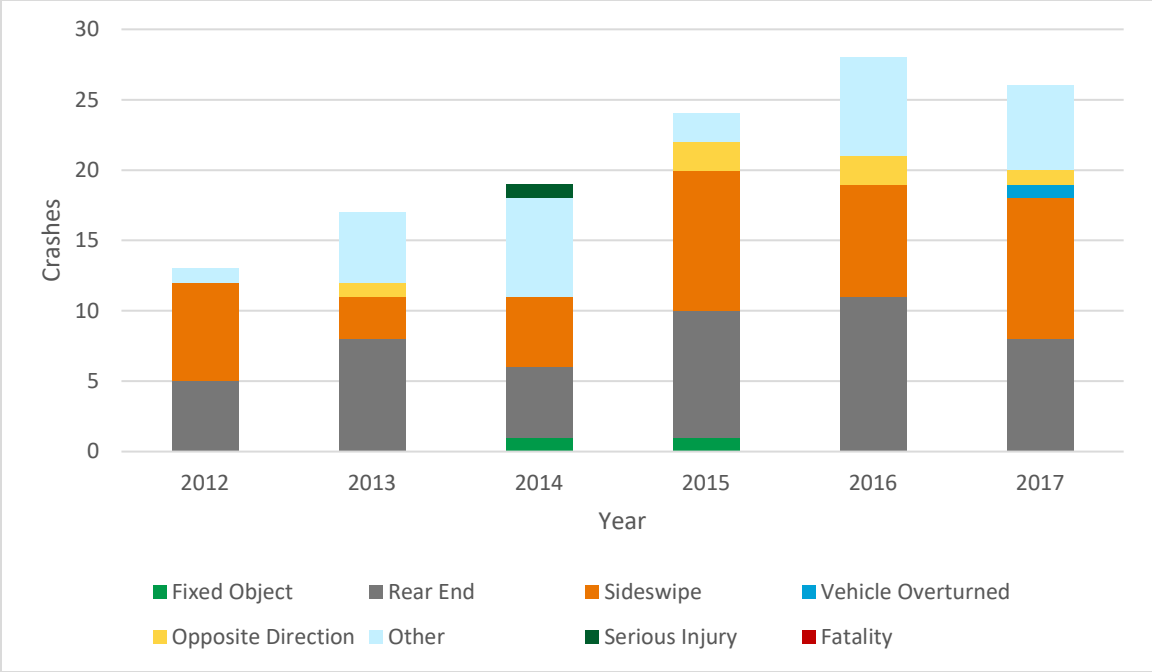


Figure 14. Crashes on SR 161 (Meridian Ave E) MP 29.87 to MP 30.04 by Year/Type

Table 12 summarizes the annual average daily traffic (AADT) and crash rate per 1 million vehicle miles for I-5, SR 509, and SR 167 between 2012 and 2017. The statewide accident rate (number of accidents per million vehicle miles) is 1.96 based on the 2015 Washington State Annual Collision Summary (WSDOT 1996). The 2012-2017 accident rate for I-5 mainline is 1.08 and for SR 509 is 1.18, which is below the statewide collision rate; whereas the collision rates along SR 167 and SR 161 are 3.46 and 3.99 respectively, which are higher than the Washington State's average collision rate. In the 2006 FEIS, collision rates on the River Road portion of SR 167 were recorded as between 1.67 and 2.75 crashes per million vehicle miles. The average collision rate for this section of roadway is 3.35 crashes per million vehicle miles from 2012 to 2017.

Table 12. Existing Crash Rates by Roadway (2012 to 2017)

Route	Milepost Limits (miles)	Annual Average Daily Traffic (vehicles per day)	Crash Rate (per million vehicle miles)
I-5	MP 135.69 to MP 139.06	182,300	1.08
SR 509	MP 1.66 to MP 3.91 (across the Tideflats)	28,100	1.18
SR 167 (Freeway)	MP 5.26 to MP 6.44 (Meridian to e/of 512)	68,100	3.46
SR 161	MP 29.87 to MP 30.04	16,800	3.99
SR 167 (River Rd)	MP 0 to MP 5.23	30,200	3.35

Heavy volumes of traffic, geometrics that do not meet current standards, and interchange-related congestion are the primary contributing factors to the accidents. This project, along with WSDOT's Tacoma HOV program, will correct some of the geometric deficiencies and reduce interchange-related congestion on I-5. As for the congestion-related accidents, the proposed SR 167 project will provide relief with the addition of the SR 167/I-5 Interchange and the SR 167/SR 161 interchange, and the reduction of traffic volumes from arterial roadways between Puyallup and I-5.

Port, Rail and Transit Facilities

Major regional non-highway transportation facilities and services exist within the project area. These facilities include the Port of Tacoma, railroad operations, and transit agencies providing local and regional services with bus and commuter rail lines.

Port of Tacoma

In 2015 the Port of Tacoma joined the Port of Seattle to form the Northwest Seaport Alliance in an effort to capitalize on the strengths of the individual ports and leverage strategic investments to compete more effectively with other national and international ports. Recent transportation projects completed in the Port of Tacoma area include: the upgrading of Port of Tacoma Road to better accommodate heavy trucks and the installation of two 7,000-foot intermodal rail tracks in collaboration with Tacoma Rail. The Port of Tacoma is also involved in supporting a project to upgrade the I-5/Port of Tacoma Road Interchange through financial and real-estate contributions.

In 2016, the Port of Tacoma processed a cargo volume of over 28 million metric tons[2] with the vast majority (over 90%) being container traffic. This volume of container traffic makes it one of the top container ports on the West coast, serving as a transfer point between rail, truck and ship for cargo to and from other ports on the Pacific Rim and domestic markets in the Northwest, Midwest and East Coast. Container cargo with origins or destinations in the Northwest is typically moved to and from the port via truck, resulting in high number of container hauling truck trips in and out of the port on the regional roadway system. Other activities that generate significant truck volumes include: auto handling, timber, break-bulk, and dry-bulk. Key roadway facilities utilized by port-related truck traffic include: SR 509, SR 99, I-5, 54th Avenue, Port of Tacoma Road, Portland Avenue, I-705, 70th Avenue, and River Road/SR 167.

Major terminals at the Port of Tacoma include: Totem Ocean Trailer Express Terminal, Pierce County Terminal, Washington United Terminals, Husky Terminal, Olympic Container Terminal and APM terminals. Combined, these terminals generate over 10,000 daily truck trips.[3] The distribution of truck trips was analyzed as part of the 2011 Tideflats Area Transportation Study. Key local origins and destinations for Port related truck trips include the following, with approximately:

- 15% of the truck trips to/from the Fife area bounded by 70th Avenue and Freeman Road,
- 12% to/from the area bounded by Valley Avenue, Levee Road, 70th Avenue and SR 161.
- Longer distance truck trips were distributed with 10% on I-5 to the north and 24% on I-5 to the south of the project area.

The remaining Port related truck trips were observed to be either internally distributed between different areas of the Port of Tacoma, to/from southeast Tacoma or to/from other regional state highways.

Rail Operations

The project area is served by two intercontinental railroads and a local short line railroad. The majority of rail traffic in the project area services container ships. Existing rail lines also provide passenger service between Vancouver BC, Seattle, Tacoma and Portland.

[2] www.nwseaportalliance.com/sites/default/files/seaport-alliance-5-year_history-12_dec.pdf
[3] Tideflats Area Transportation Study Final Report; June 2011

Tacoma Rail, an operating division of Tacoma Public Utilities, switches freight between the two intercontinental railroads and also provides service to the Port of Tacoma 24 hours a day/seven day a week. The railroad has 38 miles of track in the Port of Tacoma area.

Burlington Northern Santa Fe (BNSF) railroad operates rail lines generally throughout much of the US with Birmingham, Alabama representing the eastern most city served by the railroad. In the Northwest, north-south service between major cities generally extends between Vancouver BC and Vancouver, Washington and Portland, Oregon. East-west service traverses Snoqualmie and Stevens passes to connect with lines extending to the Midwest. Between Seattle and Tacoma, the railroad passes through the cities of Tukwila, Renton, Kent, Auburn, Pacific, Sumner and Puyallup. Approximately 60 freight trains operate daily on the line. Passenger service includes approximately 14 trips per day. The BNSF mainline is located on the south side of the Puyallup River. The BNSF track serving the Port of Tacoma is located west of Port of Tacoma Road. Neither track is directly affected by the SR 167 Connection project.

The Central Puget Sound Regional Transit Authority (a.k.a. Sound Transit) operates commuter rail trains between Tacoma and Seattle with 26 trips daily on the BNSF mainline. The service averages more than 16,000 passengers daily between Seattle and Tacoma.

The Union Pacific Railroad (UPRR) mainline operates a single track through the southern portion of the SR 167 Completion Project area. The mainline tracks are part of the UPRR Seattle to Tacoma mainline. Railroad yard facilities are located south of I-5 in the vicinity of Frank Albert Road. South of Tacoma to Portland, Oregon, UPRR trains operate on BNSF tracks. Approximately 16 trains each day use the Seattle to Tacoma mainline. With the exception of Valley Avenue and Frank Albert Road, local arterial streets cross the railroad at grade. The new segment of SR 167 freeway will construct a bridge over the UPRR mainline west of Freeman Road in Fife.

Transit

The project area lies within the Pierce County Public Transit Benefit Area and Sound Transit service boundary. Pierce Transit provides bus service within the area including local routes servicing Tacoma, Fife, Federal Way and Milton. Pierce Transit and Sound Transit coordinate to provide express bus service to Seattle and Bellevue. The Tacoma Dome station acts as an intermodal hub for the city of Tacoma providing a 2,400-stall parking garage and transfer facility that allows transit riders access to Pierce Transit and Sound Transit buses, Sound Transit commuter rail, Amtrak passenger rail, and Greyhound inter-city buses. Transit routes operating within the study area include: the 500 series express routes serving destinations in King County, the 400 series routes serving Puyallup and east Pierce County, and the local routes serving areas throughout the city of Tacoma with connections at the Tacoma Dome station.

4. Would the Phase 1 Improvements Result in any New or Significant Impacts?

As described previously in Section 3, the year of opening for the Phase 1 Improvements (2030) is not analyzed as part of this re-evaluation. The future long-term effects described in this chapter are a comparison of the No Build conditions and the Phase 1 Build conditions for the year 2045. The results of this No Build to Build comparison will be contrasted to the results presented in the 2006 FEIS to understand if there are any new or significant impacts.

2045 No Build Alternative

In the Phase 1 No Build condition, the existing SR 167 freeway would remain in its current configuration and the limited access configuration would terminate at Meridian Avenue in Puyallup, with no direct freeway connection to the regional transportation highway system. The following road improvement projects in the study area in the 2045 No Build condition could also affect travel patterns:

- Completion of the Port of Tacoma Road/I-5 Interchange improvements
- Completion of the 54th Avenue E/I-5 interchange improvements
- Completion of the I-5/SR 18 Triangle improvements
- Extension of the existing SR 167 high-occupancy toll (HOT) lanes south to SR 410

A complete list of regional background projects assumed to be completed by 2045 in the No Build condition is provided in Attachment E.

2045 Build Alternative

The 2045 Build Alternative consists of the Phase 1 Improvements which were described in Section 2. These improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue undercrossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is planned (based on Legislative intent) to be a fully tolled facility.

Circulation Changes

Freeway Network

Major circulation changes will occur with the completion of the SR 167 extension project. With the SR 509 Spur, the regional freeway network will gain a valuable connection for truck traffic traveling from the Port of Tacoma to the north via I-5 or east via the new SR 167 connection to industrial activity centers in the Fife Valley, Puyallup and Sumner—and ultimately providing connections to I-90 via SR 18. Additionally, SR 167 traffic previously diverting to River Rd. to access I-5 south will have a more direct route to I-5 using the new SR 167 connection. Traffic volume reductions are also expected on SR 167 north of Puyallup as traffic uses the new SR 167 connection to access the I-5 corridor rather than use the congested SR 167 facility north to Renton.

Local Roadway Network

With the proposed project, drivers on the local roadway system will be provided access to and from the new SR 167 to the west with a half-diamond interchange at Valley Avenue and a full single point urban interchange at Meridian Avenue. Local traffic in the Tacoma Tideflats area will also be able to reach I-5 more directly via the SR 509 Spur via a half-diamond interchange with 54th Avenue E. Traffic volumes will be reduced along Valley Avenue and in existing residential areas near 54th Avenue East, including a high percentage of truck traffic. In addition to 2045 reduced traffic volumes, the improvements recently provided by the City of Fife and the City of Puyallup along Valley Avenue have improved capacity and operations of the local system. The 70th Avenue overcrossing of I-5 will be rebuilt with a four-lane structure to replace the existing two-lane facility, thereby increasing capacity on this key crossing of I-5.

Comparison to 2006 FEIS

The improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide generally similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS, with the following notable differences:

- In comparison to the grade separated connection in the 2006 FEIS Build Alternative, the at-grade connection through the SR 509 intersection Alexander Road in the Phase 1 Alternative will result in increased travel time between SR 167/I-5 and downtown Tacoma and Port facilities west of Alexander Road
- Local access to the new SR 167 to/from the east will not be provided from Valley Avenue with the Phase 1 Improvements, reducing local access benefits in comparison to the 2006 FEIS
- No Park-and-Ride lots are proposed in the Phase 1 Improvements as compared to two new park-and-ride facilities proposed in the 2006 FEIS Build Alternative
- Tolling of the new SR 167 extension and the SR 509 Spur with the Phase 1 Improvements will allow for the capability to sustainably manage the demand using the new facilities

Traffic Projections

Table 13 summarizes the 2045 AM and PM peak hour traffic volumes in the study area for the No Build and new Phase 1 Build conditions. The volume measurement point locations are shown on Figure 15. These traffic projections differ from those developed for the 2006 FEIS because they are based on results from a dynamic traffic assignment (DTA) model which accounts for the effect of constrained conditions on traffic volumes. In some instances, even though the traffic demand for a facility is higher, the actual throughput volume is lower due to congestion. The DTA model projects this to occur in some instances on I-5 in the peak periods. This effect was not accounted for with the modeling tools used for the 2006 FEIS. Key observations about the forecasted traffic with and without the project include the following:

- The proposed Phase 1 project generally results in slightly increased peak hour traffic volumes on I-5 in the off-peak directions (southbound AM and northbound PM), but in the peak directions results in minimal to no increases for northbound AM, and minimal increase to notable decrease for southbound PM peak hour traffic. In one case, at I-5 north of the Fife curve, southbound PM traffic volumes for the Phase 1 project are slightly lower than the No Build as this section of I-5 operates under constrained conditions with lower vehicle throughput.
- Peak hour traffic volumes on SR 167 north of Puyallup are expected to decrease with the project in both directions in both peak hours.
- Traffic on arterials between Puyallup and I-5, including Valley Avenue, River Road, 70th Avenue, 20th Street, and 54th Avenue are projected to experience notably lower peak hour volumes with the Phase 1 Build Alternative as the SR 167 Extension provides a significantly faster connection than the arterials.
- Pacific Highway (SR 99) in Fife, is expected to experience reduced peak hour volumes with the Phase 1 project, particularly the section between 54th Avenue and Port of Tacoma Road.

Table 13. Future (2045) AM and PM Peak Hour Traffic Volumes on Study Area Roads

Measurement Point	Location	Direction	AM Peak Hour			PM Peak Hour		
			No Build	Build	+/	No Build	Build	+/
1	I-5 south of Port of Tacoma Road	NB	7640	7850	3%	6980	7180	3%
		SB	7850	7980	2%	7370	7440	1%
		Total	15490	15830	2%	14350	14620	2%
2	I-5 north of Port of Tacoma Road	NB	7990	8060	1%	6590	7170	9%
		SB	7210	7520	4%	6230	5860	-6%
		Total	15200	15580	3%	12820	13030	2%
3	I-5 north of the Fife Curve (south of SR 18)	NB	8230	8290	1%	6540	6530	0%
		SB	5240	5510	5%	5300	5050	-5%
		Total	13470	13800	2%	11840	11580	-2%
4	I-5 north of SR 18	NB	7400	7240	-2%	6250	6790	9%
		SB	5370	5520	3%	7400	7260	-2%
		Total	12770	12760	0%	13650	14050	3%
5	SR 18 west of Military Road	EB	3580	3330	-7%	3610	3670	2%
		WB	3880	3410	-12%	3300	4270	29%
		Total	7460	6740	-10%	6910	7940	15%
6	SR 167 north of 24th Street E	NB	4730	4440	-6%	4040	3480	-14%
		SB	2570	2230	-13%	4290	4160	-3%
		Total	7300	6670	-9%	8330	7640	-8%
7	SR 167 north of SR 512	NB	3800	3280	-14%	3580	3400	-5%
		SB	2730	3260	19%	3860	3850	0%
		Total	6530	6540	0%	7440	7250	-3%
8	Meridian Avenue south of N Levee Road	NB	1760	1980	13%	1860	1260	-32%
		SB	1630	1150	-29%	2280	2030	-11%
		Total	3390	3130	-8%	4140	3290	-21%
9	SR 161 south of 43rd Street Ct E	NB	620	450	-27%	320	280	-13%
		SB	290	150	-48%	220	420	91%
		Total	910	600	-34%	540	700	30%
10	Valley Avenue east of Freeman Road	EB	640	300	-53%	1130	510	-55%
		WB	1150	930	-19%	550	390	-29%
		Total	1790	1230	-31%	1680	900	-46%

Measurement Point	Location	Direction	AM Peak Hour			PM Peak Hour		
			No Build	Build	+/	No Build	Build	+/
11	Valley Avenue west of 70th Avenue	EB	590	490	-17%	680	450	-34%
		WB	1020	380	-63%	710	520	-27%
		Total	1610	870	-46%	1390	970	-30%
12	70th Avenue E north of 20th Street E	NB	360	450	25%	270	350	30%
		SB	420	260	-38%	1010	950	-6%
		Total	780	710	-9%	1280	1300	2%
13	River Road (SR 167) east of 30th Avenue E	EB	800	730	-9%	1040	810	-22%
		WB	1120	840	-25%	920	790	-14%
		Total	1920	1570	-18%	1960	1600	-18%
14	54th Avenue E south of 20th Street E	NB	1030	590	-43%	790	600	-24%
		SB	760	450	-41%	750	380	-49%
		Total	1790	1040	-42%	1540	980	-36%
15	20th Street E east of 54th Avenue E	EB	850	400	-53%	730	460	-37%
		WB	790	640	-19%	940	340	-64%
		Total	1640	1040	-37%	1670	800	-52%
16	Pacific Highway (SR 99) east of 54th Avenue E	EB	1500	1240	-17%	1070	810	-24%
		WB	630	600	-5%	1320	1050	-20%
		Total	2130	1840	-14%	2390	1860	-22%
17	Pacific Highway (SR 99) west of 54th Avenue E	EB	940	650	-31%	930	680	-27%
		WB	740	330	-55%	1470	890	-39%
		Total	1680	980	-42%	2400	1570	-35%
18	54th Avenue E north of Pacific Highway (SR 99)	NB	580	390	-33%	570	570	0%
		SB	640	590	-8%	790	770	-3%
		Total	1220	980	-20%	1360	1340	-1%
19	Taylor Way east of SR 509	NB	480	540	13%	930	740	-20%
		SB	620	620	0%	700	670	-4%
		Total	1100	1160	5%	1630	1410	-13%
20	SR 509 east of Port of Tacoma Road	EB	1500	1670	11%	1320	1560	18%
		WB	1060	1260	19%	2240	2250	0%
		Total	2560	2930	14%	3560	3810	7%

Measurement Point	Location	Direction	AM Peak Hour			PM Peak Hour		
			No Build	Build	+/	No Build	Build	+/
21	Pacific Highway (SR 99) north of Porter Way	NB	1480	1130	-24%	960	1060	10%
		SB	450	470	4%	2360	2230	-6%
		Total	1930	1600	-17%	3320	3290	-1%
22	SR 509 Spur west of 54th Avenue E	NB	na	670	na	na	920	na
		SB	na	380	na	na	400	na
		Total	na	1050	na	na	1320	na
23	SR 509 Spur west of I-5	NB	na	1050	na	na	1180	na
		SB	na	610	na	na	920	na
		Total	na	1660	na	na	2100	na
24	SR 167 Extension east of I-5	NB	na	2540	na	na	1860	na
		SB	na	1660	na	na	2220	na
		Total	na	4200	na	na	4080	na
25	SR 167 Extension west of Meridian Avenue	NB	na	2520	na	na	1710	na
		SB	na	1630	na	na	2200	na
		Total	na	4150	na	na	3910	na

1 Volume measurement points are displayed in Figure 15.
2 Volumes are in vehicles per hour (vph)
3 NB = northbound; SB = southbound; EB = eastbound; WB = westbound;
4



Figure 15. Locations for Year 2045 Traffic Volume Measurement Points

Comparison to 2006 FEIS

The 2006 FEIS presented year 2000 existing conditions and a horizon year of 2030 for the No Build and Build conditions. While AM and PM operations on I-5 were discussed in the 2006 FEIS, only PM peak hour conditions were reported for local roadway intersection operations. Since the 2006 FEIS was based on year 2000 conditions, it was determined that it was necessary to update existing conditions to more current conditions. Consequently, this 2017 TDR presents 2016 existing conditions and a horizon year of 2045 (approximately 20 years beyond the anticipated opening of Phase 1- Stage 1) for No Build and Build conditions for AM and PM peak hour operations for both freeway and arterial intersection operations. The 2006 FEIS Build Alternative did not include tolls on the project roadways, and used traditional travel modeling tools to assess expected roadway performance. The analysis supporting this 2017 TDR includes the assumption of tolled roadways, and is based on results from a dynamic traffic assignment (DTA) model that more accurately assesses current and future freeway conditions compared to the 2006 analysis, particularly under congested conditions. Key observations regarding differences in traffic projections between the 2006 FEIS and the 2017 TDR include the following:

- Because the 2006 FEIS used an earlier year for existing conditions—year 2000 as compared to year 2016, existing conditions average daily traffic (ADT) volumes on I-5 overall were lower than the 2017 TDR existing condition by 14 to 18 percent. Also, on SR 167 north of SR 512 they were lower by 33 percent and on SR 512 south of SR 167 they were lower by 39 percent. However, on SR 509 across the Tacoma Tideflats between Alexander Road and Port of Tacoma Road they remained relatively unchanged between the 2006 FEIS and the 2017 TDR.
- Future year traffic forecasts for study area roadways in the 2017 TDR are also lower than those in the 2006 FEIS. This is due to multiple factors. The current forecasting tools provide higher resolution as they are able to constrain volumes more realistically than the 2006 tools. Additionally, the inclusion of tolling to manage demand has reduced some volumes on the new facilities. The future forecasts generated in 2006 and 2017, however, show similar patterns of increased demand on the existing facilities.

Highway Performance

Peak Period Congestion and Queues

Figure 16 presents the future (2045) AM temporal speed data for northbound I-5 for the No Build and proposed Phase 1 Build conditions, and Figure 17 presents future (2045) PM temporal speed data for southbound I-5 for the No Build and proposed Phase 1 Build conditions. These temporal speed maps are comparable to those shown for existing conditions in the Affected Environment Section, however these are produced directly from the DTA model and hence results in a different color scheme and speed range format.

As shown in Figure 16, under the No Build conditions, at the beginning of the AM peak period (around 6:00 AM), northbound congestion is expected to emanate from the Fife curve area all the way back to south of the Puyallup River Bridge toward I-705. As the peak period progresses, however, the bottleneck south of the Puyallup River becomes more severe, and by 6:30 AM effectively meters the traffic which can get past it, resulting in relatively higher speeds north of the Puyallup River until minor slowdowns occur near the Fife curve area—which includes a slight uphill grade—and at the high-volume off-ramp to eastbound SR 18. Northbound travel speeds between I-705 and the Fife curve are projected to average in the range of 25 to 40 mph around 6:00 AM, indicating LOS F operating conditions. From 6:45 to 9:00 AM, speeds in the Tacoma Dome area up to the Puyallup River Bridge are expected to decrease further to 10-30 mph; though north of that point flow is expected to be 45 to 60 mph except for the slowdowns at the Fife curve and at SR 18.

Under the proposed Phase 1 Build conditions, as shown in Figure 16, the congestion patterns would be somewhat similar to No Build. Minor differences include slightly less congestion around the Port of Tacoma Road interchange area during the 6:00 to 7:00 AM time period; but slightly more congestion emanating from the on-ramp at the new SR 167 interchange during the 7:30 to 9:00 AM time frame. The level of congestion expected at SR 18 is similar to what is projected for the No Build condition.

Figure 17 indicates that southbound congestion in the PM peak period would occur on I-5 in both the No Build and Build conditions. In both cases, congested conditions are expected throughout the peak period in the southern portion of the corridor—beginning south of the Puyallup River Bridge and reaching back to the Fife curve area. In the No Build condition, this congestion stretches beyond the Fife curve by 3:30 PM, and eventually to the SR 18 interchange by 5:30 to 6:00 PM. In the proposed Phase 1 Build condition, congestion is expected to form around the new SR 167 interchange and around the Fife curve, but not extend back to the SR 18 interchange—indicating an improvement over the No Build condition.

Temporal Speed Maps

These maps summarize the future speeds from the Dynameq model on all lanes (both general purpose and HOV lanes) of I-5 by peak direction and time of day, with green, yellow, and red representing slow congested conditions or LOS F (approximately 40 mph or less), while blue and cyan represent moderate to high speeds and LOS E or better (40 mph or higher) operating conditions. The off-peak directions of I-5 (AM southbound and PM northbound) are not shown because they are projected to operate better than the peak directions shown. Note: The current version of the Dynameq model software does not allow the user to select a color scheme, which would be comparable to the ones used in Figures 4 and 5 shown previously. It is believed that the next version of the model software will provide this function.

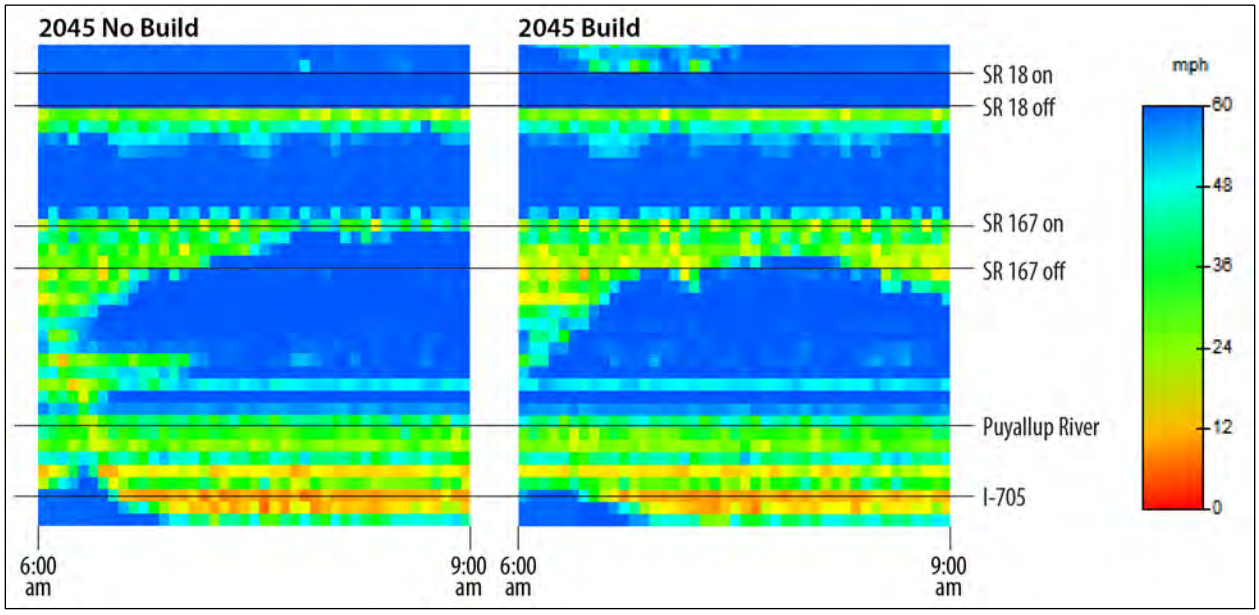


Figure 16. 2045 AM I-5 Northbound Speed Temporal Charts (No Build and Build)

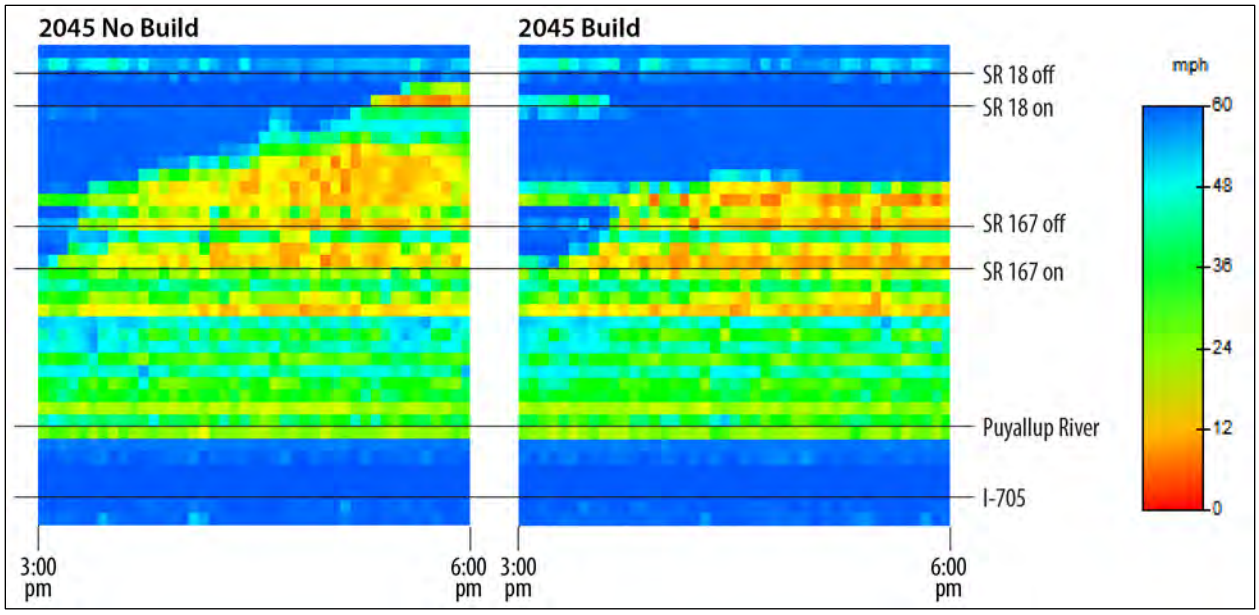


Figure 17. 2045 PM I-5 Southbound Speed Temporal Charts (No Build and Build)

Peak Period Average Speeds

Table 14 shows projected AM peak period and PM peak period corridor speeds on I-5 for the study area. In the AM peak period, Phase 1 Build condition speeds are expected to be slightly slower than projected No Build speeds in both the northbound and southbound directions. In the PM peak hour on I-5, the Build condition results in a noticeable increase in southbound speeds between SR 18 and the new SR 167 interchange. This is due to a combination of factors. Future projections indicate that the southbound I-5 mainline will experience a bottleneck at the Puyallup River Bridge and congestion will stretch back through the Fife curve area. The provision of the SR 509 Spur and SR 167 connection in the Build condition provides drivers the opportunity to get out of the queue sooner if their destinations can be reached via these new facilities. This results in substantial alleviation of the southbound congestion south of SR 18 and a 12 mph increase in speed in this section (from 19 to 31 mph). In the northbound direction, the right lane of NB I-5 is routinely full of traffic north of the Fife curve as traffic begins to stage in this lane for exiting to the weigh station\rest area and SR 18. The congestion from this offramp currently backs up to 375th Avenue or farther on a regular basis during peak periods, resulting in a reduction of average speeds across the entire mainline between Fife and SR 18. The addition of northbound traffic from the new SR 167 interchange is expected to cause a slowdown in speeds through this section, resulting in a decrease in speeds from 46 to 37 mph. However, traffic analyses indicate that the addition of a second offramp lane to SR 18 will allow traffic to use the two right lanes on NB I-5 to stage for exiting to SR 18, resulting in less of an impact to speeds across all mainline lanes. The second NB offramp lane is funded and assumed in the build condition. In addition, HOV lanes on I-5 between S. 54th Street and the Port of Tacoma interchange are funded and assumed in the build condition.

Table 14. Future (2045) Estimated Peak Period Average I-5 Travel Speeds from Dynameq Model

I 5 Segment		2045 Average Speeds (mph)			
		AM Peak Period (6:00 9:00 AM)		PM Peak Period (3:00 6:00 PM)	
		No Build	Build	No Build	Build
I-705 to SR 167	NB	32	28	49	46
	SB	50	49	16	15
SR 167 to SR 18	NB	35	29	46	37
	SB	54	52	19	31
Corridor Average: I-705 to SR 18	NB	34	29	48	43
	SB	52	50	17	19

Indicates speeds improve by 10 mph or more.

Indicates speeds degrade by 10 mph or more.

Peak Period Travel Times

Table 15 shows travel times during the AM peak period between key activity nodes in both directions for the routes shown in Figure 18. The table shows estimated travel times between nodes using current routes, and also for routes using the new facilities, where applicable. For current routes, travel times would be generally the same with Build conditions compared to No Build, with slight increases for some routes, and decreases for others. Routes 3 and 5, which connect the Port of Tacoma with Sumner and Puyallup respectively, show a decrease in travel times via the current routes, which indicates that trips would shift away from current routes onto the new SR 167 connection. For routes 2 through 5, travel times for trips using the Build facilities are improved over the corresponding trips in the No Build condition for all directions. Most notable travel time reductions include between:

- Puyallup and I-5 north - decreases by 32 percent northbound (7-minute reduction) and 39 percent southbound (7-minute reduction)
- the Port of Tacoma and Sumner - decreases by six minutes eastbound (24% reduction) and seven minutes westbound (29% reduction)
- Port of Tacoma and Puyallup – decreases by five minutes eastbound (25%) and 12 minutes westbound (44%)

Travel time route 1, reflecting travel on I-5 between I-705 and SR 18, shows a slight increase in travel times due to the higher volumes of traffic using this section, while travel times on Route 4 between the Port of Tacoma and SR 18 (east of SR 167) are expected to decrease by 11 percent eastbound and 7 percent westbound.

Table 15. Future (2045) AM Peak Period (6:00-9:00 a.m.) Travel Times from Dynameq Model

Travel Paths			Via Current Route (minutes)			Via Build Route (minutes)	
ID #	Path Description	Direction	No Build	Build	% +/	Build	% +/
1	Through study area on I-5 (I-705 to SR 18)	NB	15	18	+20%	na	na
		SB	9	10	+11	na	na
2	Puyallup to north of SR 18	NB	22	21	-5	15	-32
		SB	18	19	+6	11	-39
3	Port of Tacoma to Sumner/Pacific MIC	EB	25	24	-4	19	-24
		WB	24	22	-8	17	-29
4	Port of Tacoma to SR 18	NB	18	20	+11	16	-11
		SB	14	16	+14	13	-7
5	Port of Tacoma to Puyallup	EB	20	18	-10	15	-25
		WB	27	21	-22	15	-44



Figure 18. Year 2045 No Build and Build Travel Time Paths Measured in Dynameq Model

PM peak hour travel times from the Dynameq Model are shown in Table 16. For current routes, travel times would be generally lower with Build conditions indicating that trips would shift away from current routes onto the SR 167 extension. For routes 2 through 5, travel times for trips using the Build facilities are improved over the corresponding trips in the No Build condition for all directions. Most notable travel time reductions include between:

- Puyallup and I-5 north - decreases by 33 percent northbound (6-minute reduction) and 32 percent southbound (7-minute reduction)
- Port of Tacoma and Sumner - decreases by nine minutes eastbound (35% reduction) and 15 minutes westbound (41% reduction)
- Port of Tacoma and SR 18 east of SR 167 – decreases by 47 percent northbound (8-minute reduction) and 41 percent southbound (24-minute reduction)
- Port of Tacoma and Puyallup – decreases by nine minutes eastbound (38%) and 11 minutes westbound (38%)

Table 16. Future (2045) PM Peak Period (3:00-6:00 p.m.) Travel Times from Dynameq Model

Travel Paths		Direction	Via Current Route (minutes)			Via Build Route (minutes)	
ID #	Path Description		No Build	Build	% +/	Build	% +/
1	Through study area on I-5 (SR 705 to SR 18)	NB	11	12	+9	na	na
		SB	28	25	-11	na	na
2	Puyallup to north of SR 18	NB	18	18	0	12	-33
		SB	22	21	-5	15	-32
3	Port of Tacoma to Sumner/Pacific MIC	EB	26	25	-4	17	-35
		WB	37	28	-14	22	-41
4	Port of Tacoma to SR 18	NB	17	19	+12	9	-47
		SB	34	24	-29	10	-41
5	Port of Tacoma to Puyallup	EB	24	20	-17	15	-38
		WB	29	24	-17	18	-38

Comparison to 2006 FEIS

Regarding operations on SR 167 the improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide similar or better performance than what was indicated in the 2006 FEIS. For I-5, changes to freeway operations performance for the Phase 1 Improvements are also generally similar to those with the Build Alternative assessed in the 2006 FEIS, with the following differences:

- The 2006 FEIS indicated that peak-period congestion levels on I-5 would be somewhat better than those that would occur with the No Build Alternative. I-5 was projected to operate at LOS F south of the existing SR 167 Interchange (Portland Avenue) and north of the proposed interchange during the PM peak period. However, the 2006 FEIS project was expected to show an improved level of service on the I-5 segments between the existing SR 167 Interchange (Portland Avenue) and proposed SR 167 interchange. The

current assessment indicates that in 2045 with both the No Build and Phase 1 Build condition I-5 is expected to operate at LOS F during the peak periods in the peak directions (AM northbound and PM southbound), though the proposed Phase 1 Improvements are expected to improve PM southbound speeds from 19 mph to 31 mph. Other peak direction I-5 speeds are expected to be slightly degraded with the proposed Phase 1 Improvements.

Intersection Level of Service (LOS)

Table 17 summarizes the future 2045 intersection LOS for the AM and PM peak hours, respectively, including both the No Build and Build conditions. The locations of these intersections are shown in Figure 19. More detailed intersection results are presented in Attachment H.

Table 17. Future (2045) AM & PM Peak Hour Intersection Level of Service

Int #	Location		Intersection Type	AM Peak Hour		PM Peak Hour	
				No Build	Build	No Build	Build
1	Port of Tacoma Rd	20th Ave	Signalized	B	B	B	B
2	Port of Tacoma Rd	NB I-5 on/off ramp	Signalized	A	A	A	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	A	B	B	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	C	C	D	C
5	Port of Tacoma Rd	NB SR 509/12th St E	Signalized	B	A	C	B
6	Port of Tacoma Rd	SB SR 509	Signalized	B	A	C	C
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	E	C	B	B
8	Alexander Ave	NB SR 509	Signalized	F	C	C	D
9	Alexander Ave	SB SR 509	Signalized	F	D	F	E
10	54th Ave	Valley Ave	Signalized	C	B	A	A
11	54th Ave	23rd St	Signalized	B	A	A	A
12	54th Ave	20th St	Signalized	E	D	E	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	F	A	E	D
14	54th Ave	SB I-5 on/off ramp	Signalized	C	C	B	B
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	E	E	E	D
16	54th Ave	12th St	Signalized	A	A	B	B
17	54th Ave	8th St	Signalized	A	A	B	B
18	54th Ave	4th St	Stop-controlled	A	A	A	A
19	54th Ave	SR 509/Taylor Way	Signalized	E	D	F	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	F	B	F	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	F	A	F	B
22	70th Ave	20th Ave	Signalized	D	C	F	C
23	70th Ave	Valley Ave	Signalized	D	C	D	C
24	70th Ave	North Levee Rd	Stop-controlled	F	B	F	A
25	Pioneer Way	WB SR 512	Signalized	B	B	B	A
26	Pioneer Way	EB SR 512	Signalized	E	D	C	D

Int #	Location		Intersection Type	AM Peak Hour		PM Peak Hour	
				No Build	Build	No Build	Build
27	66th St	River Rd E (SR 167)	Signalized	E	E	E	E
28	66th St	North Levee Rd	Stop-controlled	D	D	B	A
29	Freeman Rd	20th Ave/Yuma St	Signalized	D	C	D	B
30	Freeman Rd	Valley Ave	Signalized	C	A	E	B
31	82nd Ave	North Levee Rd	Stop-controlled	A	A	A	A
32	N Meridian Ave	River Rd E SR 167	Signalized	E	D	F	C
33	N Meridian Ave	4th St NE	Stop-controlled	A	A	A	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	D	A	B	A
35	N Meridian Ave	SR 167	Signalized	E	D	D	D
36	N Meridian Ave	Valley Ave	Signalized	E	D	F	D
37	34th Ave	20th Ave	Future Intersection	A	A	A	A
38	34th Ave	SR 99 (Pacific Hwy)	Future Intersection	B	B	B	B
39	54th Ave	SR 167	Future Intersection	N/A	B	N/A	B
40	SR 99 (Pacific Hwy)	70th Ave	Future Intersection	N/A	C	N/A*	D
41	Valley Ave	SR 167 NB Ramps	Future Intersection	N/A	B	N/A	B
42	Valley Ave	SR 167 SB Ramps	Future Intersection	N/A	A	N/A	B
43	SR 167	NB I-5 Ramp	Future Intersection	N/A	C	N/A	B
44	SR 167	SB I-5 Ramp	Future Intersection	N/A	B	N/A	C

Notes: Yellow shading indicates intersection operates at LOS standard (LOS D), while red shading indicates intersection operates below LOS standard (LOS E or F). *In the No Build, the original location of the SR 99/70th Avenue intersection is projected to operate at LOS F (see intersection 21)

AM Peak Hour

In the 2045 AM peak hour, 20 of the 38 study intersections in the No Build condition are forecast to operate at or below the current standard of LOS D, compared to 10 out of 44 intersections in Build conditions. In the No Build condition, six intersections operate at LOS F, whereas, in Build condition, all the intersections operate at LOS E or better. This is due to forecasted redistribution in traffic demand volumes and selected intersection improvements under the Build conditions. The following two intersections are projected to operate below their respective LOS standards – LOS E, in the 2045 AM No Build and AM Build condition:

- 54th Avenue E/SR 99-Pacific Highway would operate at LOS E due to high delays at the westbound approach
- 48th Street E/66th Avenue E/ River Road E would operate at LOS E because of longer delays caused by northbound and southbound traffic along 66th Avenue E

All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the AM peak hour.

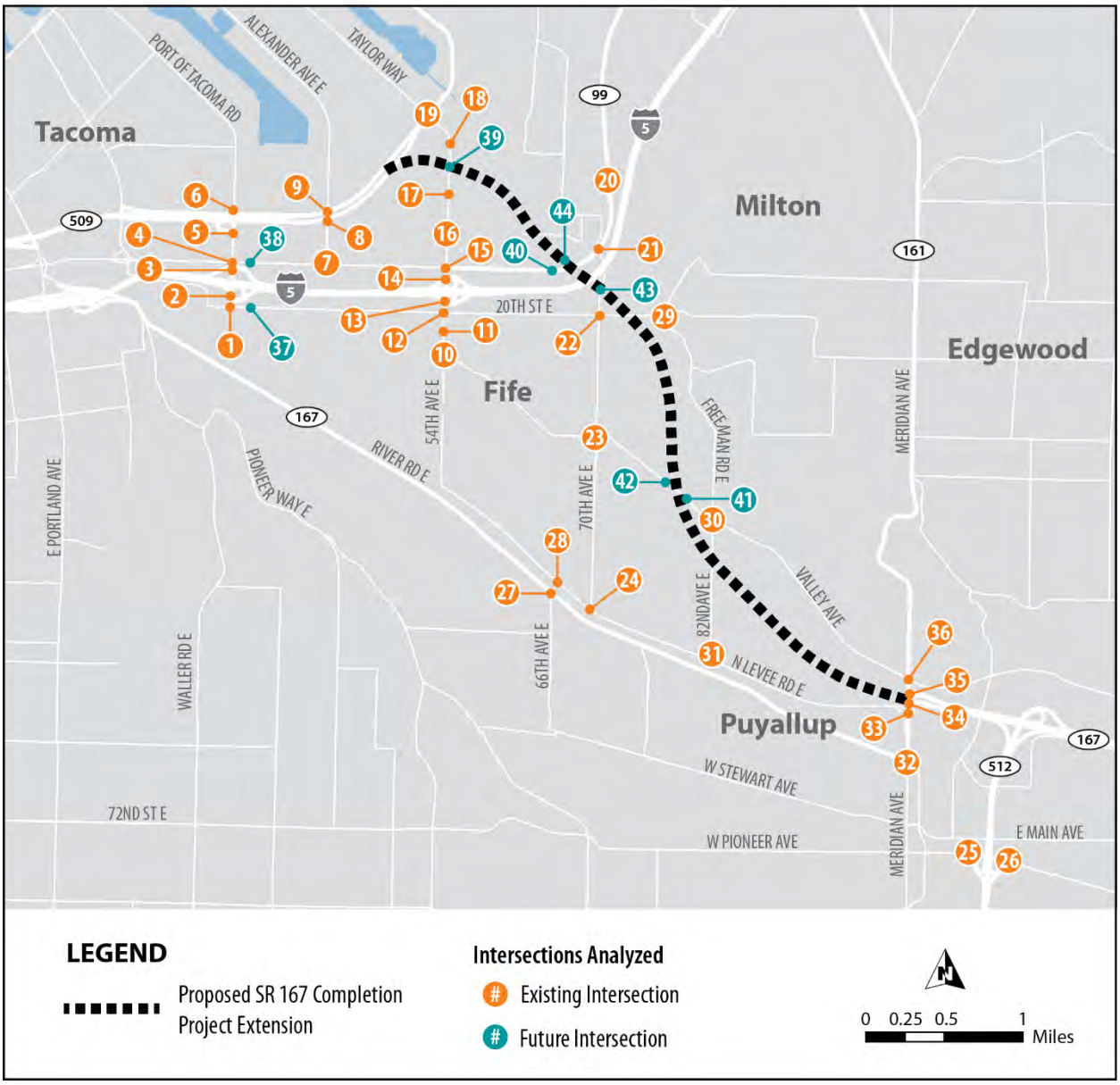


Figure 19. Locations of Intersections Analyzed (2045)

PM Peak Hour

As shown in Table 17, 17 of the 38 study intersections in the No Build condition are forecast to operate at or below the LOS D standard in the 2045 PM peak hour, compared to only 11 of the 44 intersections in the Build condition. In the No Build condition eight intersections operate at LOS F, whereas, in the Build condition no intersections operate at LOS F and only three are expected to operate at LOS E. The following intersections are projected to operate below their respective LOS standard in the 2045 PM Build condition:

- Alexander Avenue E/SR 509 (southbound) would operate at LOS E due in large part to the high delay at the northbound approach
- 48th Street E/66th Avenue E/ River Road E would operate at LOS E due to high delays caused by northbound and southbound traffic along 66th Avenue E

- 54th Ave E/SR 509 would operate at LOS E due to heavy traffic from all approaches

One intersection, Alexander Avenue E/SR 509 (northbound), would operate at LOS D in the Build condition, though it would operate at LOS C in the No Build condition. The slight degradation in operations is due to a higher redistribution of trips to the area in the Build versus the No Build condition. However, the intersection meets the LOS D threshold and does not require mitigation.

All of the new intersections created by the Phase 1 Improvements are projected to operate at LOS C or better in the PM peak hour with the exception of the relocated SR 99/70th Avenue intersection, which is projected to operate at LOS D. This compares to LOS F for the SR 99/70th Avenue intersection under the No Build conditions.

Comparison to 2006 FEIS

The 2006 FEIS considered intersection operations for the PM peak hour only. The current analysis assesses operations for both the AM and PM peak hours. Of the 32 intersections analyzed in the 2006 FEIS No Build conditions for the future horizon year of 2030, 26 were projected to operate at or below the LOS D standard—with 25 at LOS E or F. This was expected to be reduced in the 2006 FEIS Build Alternative to 18 out of 38 intersections at LOS D or worse with 16 of those being at LOS E or worse. This compares to 20 of the 38 intersections in the current assessment being at LOS D or worse in the 2045 AM peak hour and 17 intersections in the PM peak hour under No Build conditions. Conditions improve in the proposed Phase 1 Build condition where 11 of the 44 intersections being at LOS D or worse for both the AM and PM peak hours. No specific adverse impacts to intersection operations were identified in the 2006 FEIS for the Build Alternative, and the current analysis results in the same overall conclusion for the proposed Phase 1 Improvements.

Transportation Safety Performance Impacts

In the 2045 No Build condition, higher traffic volumes and levels of congestion are anticipated on the major roadways in the study area, including I-5, SR 509, SR 167, SR 161, SR 99, and other nearby arterials. As traffic volumes and congestion increases, the potential number of crashes may increase as well, although the crash rate may not change because the volumes may increase at the same rate as crashes.

The Phase 1 Improvements would draw traffic demand away from nearby facilities, including SR 167 north of Puyallup, SR 161 north of Puyallup, River Road, Valley Avenue, 20th Street E, and 54th Avenue south of I-5. In general, the reduction of traffic demand on these facilities and lower level of congestion would potentially cause a reduction in the number of crashes on those facilities, even though the crash rate may not change compared to No Build.

On the segment of I-5 through the project area, traffic volumes in the off-peak directions (southbound AM and northbound PM) are expected to increase compared to No Build, the potential number of crashes may increase as well, although the crash rate may not change because the volumes may increase at the same rate as crashes. However, volume increases are minimal to none in the northbound AM peak direction; and are expected to decrease some for southbound PM peak hour traffic. These changes will likely result in similar to fewer number of crashes for the Build even though the crash rate may not change compared to No Build.

The SR 167 extension segment between Meridian Avenue and I-5 would provide a new access-controlled facility with improved safety performance conditions. Research over the past several decades has consistently shown that crash rates increase as driveway density increases on a roadway (i.e., number of driveways per mile). The benefits of a limited access facility like the SR 167 extension include improved movement of traffic, reduced crashes, and fewer vehicle conflicts (FHWA, 2014). In addition, the facility would be tolled in order to manage traffic demand and congestion levels. The resulting lower levels of congestion of a managed toll facility will likely result in fewer number of crashes in comparison to a non-tolled facility.

Lower levels of congestion on arterials that include bicycle and pedestrian facilities could also possibly lead to fewer conflicts, even if the facilities may provide minimal improvements.

Comparison to 2006 FEIS

Safety performance effects of the proposed Phase 1 Improvements are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "Construction of the Build Alternative is expected to reduce the number of accidents within the corridor by providing a safer facility with full-access control. Year 2030 congestion levels at many key intersections will be lower than the No Build Alternative, which should result in a reduced number of accidents occurring at these intersections."

Impacts on Port, Railroad, and Transit Facilities

The Build Alternative will greatly improve traffic traveling to and from the Port of Tacoma. Truck traffic will have a direct connection to SR 167 providing an alternative to I-5 north of the project area and the ability to bypass the highly congested interchanges at Port of Tacoma Road and 54th Avenue. Local truck trips to major trucking destinations of 70th Avenue and Valley Avenue to the southeast of the Port of Tacoma area will also benefit from the improved connection.

Travel times were estimated for key truck origin/destination pairs and provide insight into the magnitude of improvements that will be experienced for truck trips with the completion of the project. AM Peak projected travel time savings for the future (2045) build scenario include the following:

- 32%—48% travel time savings between Port of Tacoma Road and Puyallup
- 24%—29% travel time savings between Port of Tacoma Road and the Sumner/Pacific Manufacturing Industrial Center (MIC)
- 11%—16% travel time savings between 54th Avenue and the Kent MIC
- 16%—19% travel time savings between 54th Avenue and SR 18

No other impacts are expected to railroad facilities or service.

Transit facilities and routes will not be impacted by the proposed facility. The proposed SR 167 extension does create opportunities for new routes serving the Sumner area should Pierce Transit view that as a viable transit market. Some impacts to transit headways may be anticipated during construction and temporary detours. Coordination with Pierce Transit will be critical in limiting increased travel times due to construction activities. In addition, the planned Link light rail extension to Tacoma will cross the proposed new SR 167 extension. WSDOT and Sound Transit will need to coordinate design and construction activities for both projects.

Comparison to 2006 FEIS

The effects of the proposed Phase 1 Improvements on Port, railroad and transit activities are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "The Build Alternative will greatly improve traffic traveling to and from the Port of Tacoma. The northbound I-5 access will be more direct via SR 167 with free-flowing conditions. Port traffic to Eastern Washington can remain on SR 167 to access I-90 via I-405 or SR 18 in Kent, avoiding the steep grade portion of SR 18 near I-5."

Two park-and-ride lots included in the 2006 FEIS are not included in the list of proposed Phase 1 Improvements as they are no longer being pursued by Pierce Transit. Further, the 2006 FEIS assumed that direct freeway connections would be provided for the SR 167 general-purpose and HOV lanes at the I-5/SR 167 interchange. The Phase 1 project design proposes a diverging diamond interchange between I-5 and SR 167 and does not include center-to-center HOV direct connections; however, the design will not preclude them. Future HOV direct connections could be accommodated using a flyover type configuration for the proposed I-5/SR 167/SR 509 spur Diverging Diamond Interchange.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Year 2045 Phase 1 No Build Alternative

Development will continue to escalate in the Puyallup Valley as the area continues to move away from its agricultural base to an area zoned for light industrial and manufacturing uses. Currently, I-5 operates at over capacity conditions through the project area. The surface street system also operates at over capacity conditions on sections of River Road, 54th Avenue East and 70th Avenue East and at several key intersections. Truck traffic on residential streets is increasing.

The City of Fife, the City of Milton, and the City of Puyallup will continue to make improvements to the local system as funding becomes available. From Table 17 and Figure 19 it is evident that many intersections will operate at or below the LOS threshold (LOS D) for the study area by 2045. In order to handle increased traffic volumes on the local streets, construction of additional lanes, turning lanes, and signal upgrades or other forms of intersection control, such as roundabouts will be necessary.

Year 2045 Phase 1 Build Alternative

The analysis of the No Build to Build alternative for year 2045 shows that most of the local streets and intersections will operate better with the Build alternative, resulting in improved travel times. I-5 shows a slight increase in travel time in the northbound direction during the AM peak period, but shows a reduction in travel time in the southbound direction during the PM peak period. The analysis also shows an improvement in safety performance at all locations surrounding the project as well as better connectivity for bikes and pedestrians. The analysis identified an existing bottleneck at the northbound offramp to SR 18. The addition of an I-5 second northbound offramp to SR 18 are assumed in the build condition and are funded by the same source as this project. Capacity improvements to I-5 from Tacoma to Tukwila are a regional issue and are being analyzed by WSDOT's Management of Mobility Office.

The Phase 1 Improvements results in operations at the intersection of Alexander Road and Northbound SR 509 degrading from LOS C to LOS D in the 2045 PM peak hour. However, since the intersection meets the City of Tacoma's LOS threshold of LOS D for this area, it does not require mitigation.

The SR 167 Tier II FEIS Traffic Report identified traffic mitigation measures in the project area and the design team has reviewed each location and determined whether each mitigation can be included or are appropriate in the Phase 1 project (see Table 18).

Table 18. Previously Identified Traffic Mitigation Areas

Location	Mitigation	Previous Outcome	Current Outcome (Phase 1)
Existing SR 167: SR 161 to SR 512 (both directions)	Add auxiliary lanes	Added to design	Maintain in design
Intersection of 20th St/70th Ave	Add 2 roundabouts	Added to design	No longer relevant for revised Phase 1 design, therefore not included.

Comparison to 2006 FEIS

The 2006 FEIS identified two transportation-related mitigation measures as shown in Table 18 which were subsequently added to the proposed design. These included the following:

- Existing SR 167: SR 161 to SR 512 – add auxiliary lanes in both directions
- Intersection of 20th St/70th Ave – add 2 roundabouts

The first of these, the auxiliary lanes on SR 167 between SR 161 (Meridian Avenue) and SR 512 have been incorporated into the Phase 1 improvement design. The second one, the roundabouts at the intersection of 20th Street/70th Avenue, has been determined to not be necessary for mitigation purposes. The Phase 1 Improvements do not include grade separation of SR 509 with Alexander Road (which *was* assumed in the 2006 FEIS Build Alternative) and analysis indicates that operations at the northbound SR 509 intersection with Alexander Road would degrade from LOS C to LOS D under the Phase 1 Build condition in the 2045 PM peak hour. However, since the intersection meets the City of Tacoma's LOS threshold of LOS D for this area, it does not require mitigation.

The 2006 FEIS included two park-and-ride lots: SR 161 and Valley Avenue Park & Ride lots. The Phase 1 Improvements do not include these or any other lots (see Table 1).

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than the 2006 FEIS Build Alternative.

Currently, the Phase 1 Improvements are anticipated to be constructed in two stages, based on funding cash flow. Listed below are the project elements associated with each stage:

- Stage 1: relocation of the 70th Avenue crossing of I-5 and construction of the SR 509 Spur connecting the current SR 509 with I-5 (anticipated completion by 2025)
- Stage 2: completion of the SR 167 Extension between I-5 and SR 161 in Puyallup (anticipated completion by 2030)

Along the length of the corridor, construction impacts on traffic operations will occur. The timing and extent of closures and/or detours will be determined in the design phase of the project. The detour routing plan will also analyze effects of rerouted traffic on detour routes and develop an operations plan to mitigate the effects of the increases in traffic.

Construction of the I-5 interchange will require placement of SR 167 mainline and ramp structures over I-5 travel lanes. I-5 freeway lane closures will be limited to nighttime periods of low traffic volumes. Advisory signing and media notices will give advance warning of any extended lane closures. Most overhead roadways will be constructed in phases, allowing surface street traffic to be maintained by shifting traffic from one side of the road to the other.

Construction activities will be coordinated with UPRR, BNSF, Tacoma Rail, and the Port of Tacoma to minimize disruption of rail operations through the project construction areas.

WSDOT construction practices will be followed for detour traffic signing and traffic operations through construction work zones. To the extent possible, traffic disruptions from adjacent local improvement projects will be coordinated to minimize delay on the surface streets.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The mitigation measures as described in Section 3.14.4 of the 2006 FEIS and under the Transportation section of the Record of Decision for SR 167 Extension Project (2007) remains applicable to the Phase 1 Improvements.

8. Conclusion and Comparison between the 2018 TDR and 2006 FEIS

Overall, the conclusions from this 2018 TDR indicate that there would generally be an overall improvement in traffic operations and no other new significant traffic impacts as a result of the Phase 1 Improvements. This section presents a summary comparison of the 2006 FEIS to the 2018 TDR. The 2006 FEIS presented year 2000 existing conditions and a horizon year of 2030 for the No Build and Build conditions. While AM and PM operations on I-5 were discussed in the 2006 FEIS, only PM peak hour conditions were reported for local roadway intersection operations. This 2018 TDR presents 2016 existing conditions and a horizon year of 2045 for No Build and Build conditions for AM and PM peak hour (and peak period) operations for both freeway and arterial intersection operations.

Volumes and Forecasts

Existing conditions volumes

In the 2006 FEIS, 2000 existing conditions average daily traffic (ADT) volumes on I-5 overall were lower than the 2018 TDR existing condition by 14 to 18 percent. On SR 167 north of SR 512 they were lower by 33 percent and on SR 512 south of SR 167 they were lower by 39 percent. However, on SR 509 across the Tacoma Tideflats between Alexander Road and Port of Tacoma Road they remained relatively unchanged between the 2006 FEIS and the 2018 TDR.

Land use forecasts

For the 2006 FEIS, the future year (2030) land use data were developed by the PSRC as a working draft for updating its 2030 Metropolitan Transportation Plan, reviewed and refined by Pierce County staff. The refinements, with PSRC's control total remaining fixed, were made to more accurately reflect the most recent housing growth trend and the potential developable lands available. In the 2018 TDR, the most recent land use

projections forecasts from the current PSRC model were used. Similar to the 2006 FEIS approach, these forecasts were then refined for the Gateway Program area through discussions with local jurisdictions in order to more accurately reflect intended local jurisdictional allocation of future development. The forecasting approach was consistent in both efforts with both using PSRC official numbers as a basis and then refining based on local jurisdictional input.

Traffic volume forecasts

For the I-5 mainline, the 2006 FEIS forecast approximately 32 percent growth in traffic volumes from 2000 existing conditions to 2030 No Action, which is approximately 0.93 percent growth per year. These forecasts were based on a traditional travel demand forecasting model and reflect average daily traffic (ADT) growth. The 2018 TDR, which used a DTA model to develop traffic volume forecasts, projects between -0.4 and 0.8 percent annual growth for the AM and PM peak hours, reflecting a more constrained condition. Additionally, when traffic becomes extremely congested, throughput volumes decrease. This effect is better captured by the DTA model than with the modeling tools used for the 2006 FEIS. The 2006 FEIS Year 2030 No Action volumes on I-5 southbound in the PM peak hour were higher than the 2045 No Build condition volumes for the 2018 TDR, thus indicating that much more aggressive forecasts were being used in the 2006 FEIS to design the facility needs.

Comparing No Build to Build volume pattern changes, the 2006 FEIS showed that ADT volumes on I-5 would decrease south of the new SR 167 interchange by eight to 12 percent with the Build condition, but would increase north of the new interchange by approximately six percent. The increase in volumes north of the new interchange reflects that the SR 167 completion segment between Puyallup and I-5 will attract some additional traffic to and from I-5 to the north. The decrease in volumes projected by the 2006 FEIS for I-5 south of the new interchange reflects attraction that the SR 509 Spur connection would have on traffic accessing both the Port of Tacoma as well as downtown Tacoma. In the 2018 TDR, the changes between the future No Build and Build conditions were less dramatic, ranging between +/- five percent.

In the 2006 FEIS, volumes on the new SR 509 Spur west of I-5 were forecast to be more than twice the levels shown in the 2018 TDR forecasts. The 2030 directional design hourly volume (DDHV) on the SR 509 Spur west of I-5 in the 2006 FEIS was forecast to have 2,700 vph eastbound and 2,600 vph westbound, while the 2018 TDR shows the highest directional peak hour volumes as 1,180 vph eastbound and 920 vph westbound. The 2006 FEIS did not assume tolling on the SR 509 Spur, while the 2018 TDR does assume tolling.

Similarly, for the proposed SR 167 completion segment between I-5 and Valley Avenue, 2030 Build volumes in the 2006 FEIS were forecast to be between 48 and 64 percent higher than the levels shown in the 2018 TDR forecasts. The 2030 directional design hourly volume (DDHV) on SR 167 east of I-5 in the 2006 FEIS was forecast to have 3,750 vph northbound and 2,220 vph southbound, while the 2018 TDR shows the highest directional peak hour volumes as 2,540 vph northbound and 1,660 vph southbound. The 2006 FEIS did not assume tolling on the proposed SR 167 facility, while the 2018 TDR does assume tolling.

Projected volumes in the 2018 TDR are lower than those in the 2006 FEIS for multiple reasons. The current forecasting tools provide higher resolution as they are able to constrain volumes more realistically than the 2006 tools. Additionally, the inclusion of tolling to manage demand has reduced some volumes on the new facilities. The future forecasts generated in 2006 and 2018, however, show similar patterns of increased demand on the existing facilities.

Circulation Changes

The improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide generally similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS, with the following notable differences:

- In comparison to the grade separated connection in the 2006 FEIS Build Alternative, the at-grade connection through the SR 509 intersection at Alexander Road in the Build Phase 1 Improvements will result in increased travel time between the SR 167/I-5 interchange and downtown Tacoma and Port facilities west of Alexander Road.
- Local access to the new SR 167 to/from the east will not be provided from Valley Avenue with the Phase 1 Improvements, reducing local access benefits in comparison to the 2006 FEIS
- No Park-and-Ride lots are proposed in the Phase 1 Improvements as compared to two new Park-and-Ride facilities proposed in the 2006 FEIS improvements
- Tolling of the SR 167 extension and the SR 509 Spur with the Phase 1 Improvements will allow for the capability to sustainably manage the demand using the new facilities

Freeway Operations

Regarding operations on SR 167, the improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide similar or better performance than what was indicated in the 2006 FEIS. For I-5, changes to freeway operations performance for the Phase 1 Improvements are also generally similar to those with the Build Alternative assessed in the 2006 FEIS, with the following differences:

- The 2006 FEIS Build Alternative indicated that peak-period congestion levels on I-5 would be slightly better than those that would occur with the No Build Alternative. I-5 was projected to operate at LOS F south of the existing SR 167 Interchange (Portland Avenue) and north of the proposed interchange during the PM peak period. However, the 2006 FEIS projected a slightly improved level of service on the northbound I-5 segment between the existing SR 167 Interchange (Portland Avenue) and proposed SR 167 interchange in the AM peak period. The current analysis, which uses the DTA model which is able to more realistically constrain volumes and speeds than the 2006 tools, indicates that in 2045 with both the No Build and Build Phase 1 Improvements condition I-5 is expected to operate at LOS F during the peak periods in the peak directions (AM northbound and PM southbound), though the proposed Phase 1 Improvements are expected to improve PM southbound speeds from 19 mph to 31 mph. Other peak direction I-5 speeds are expected to be slightly degraded with the proposed Phase 1 Improvements.

Intersection Level of Service (LOS)

The 2006 FEIS considered intersection operations for the PM peak hour only. The current analysis assesses operations for both the AM and PM peak hours. Of the 32 intersections analyzed in the 2006 FEIS No Build conditions for the future horizon year of 2030, 26 were projected to operate at or below the LOS D standard—with 25 at LOS E or F. This was expected to be reduced in the 2006 FEIS Build condition to 18 out of 38 intersections at LOS D or worse with 16 of those being at LOS E or worse. This compares to 20 of the 38 intersections in the current assessment being at LOS D or worse in the 2045 AM peak hour and 17 intersections in the PM peak hour under No Build conditions. Conditions improve in the proposed Phase 1 Build condition where 10 of the 44 intersections being at LOS D or worse for the AM peak hour and 11 for the PM peak hour. No specific adverse impacts to

intersection operations were identified in the 2006 FEIS for the Build Alternative, and the current analysis results in the same overall conclusion for the proposed Phase 1 Improvements.

Transportation Safety Performance

Safety performance effects of the proposed Phase 1 Improvements are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "Construction of the Build Alternative is expected to reduce the number of accidents within the corridor by providing a safer facility with full-access control. Year 2030 congestion levels at many key intersections will be lower than the No Build Alternative, which should result in a reduced number of accidents occurring at these intersections."

Port, Railroad, and Transit Facilities

The effects of the proposed Phase 1 Improvements on Port, railroad and transit activities are expected to be similar to what was presented in the 2006 FEIS, which stated:

> "The Build Alternative will greatly improve traffic traveling to and from the Port of Tacoma. The northbound I-5 access will be more direct via SR 167 with free-flowing conditions. Port traffic to Eastern Washington can remain on SR 167 to access I-90 via I-405 or SR 18 in Kent, avoiding the steep grade portion of SR 18 near I-5."

Conclusions

Overall, this transportation analysis indicates that even with the updated assumptions and methodologies, there would be an improvement in traffic operations and no new negative traffic effects as a result of the Phase 1 Improvements.

References

Washington State Department of Transportation (WSDOT). SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation, November 2006.

WSDOT. SR 167 Tier II EIS Traffic Report, December 2001.

National Cooperative Highway Research Program. Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design, May 2014.

FHWA. June 2012. *Manual of Uniform Traffic Control Devices*.

Washington State Department of Transportation (WSDOT). 1998 *Ramp and Roadway Traffic Volume Report*.

Washington State Department of Transportation (WSDOT). 2000 *Ramp and Roadway Traffic Volume Report*.

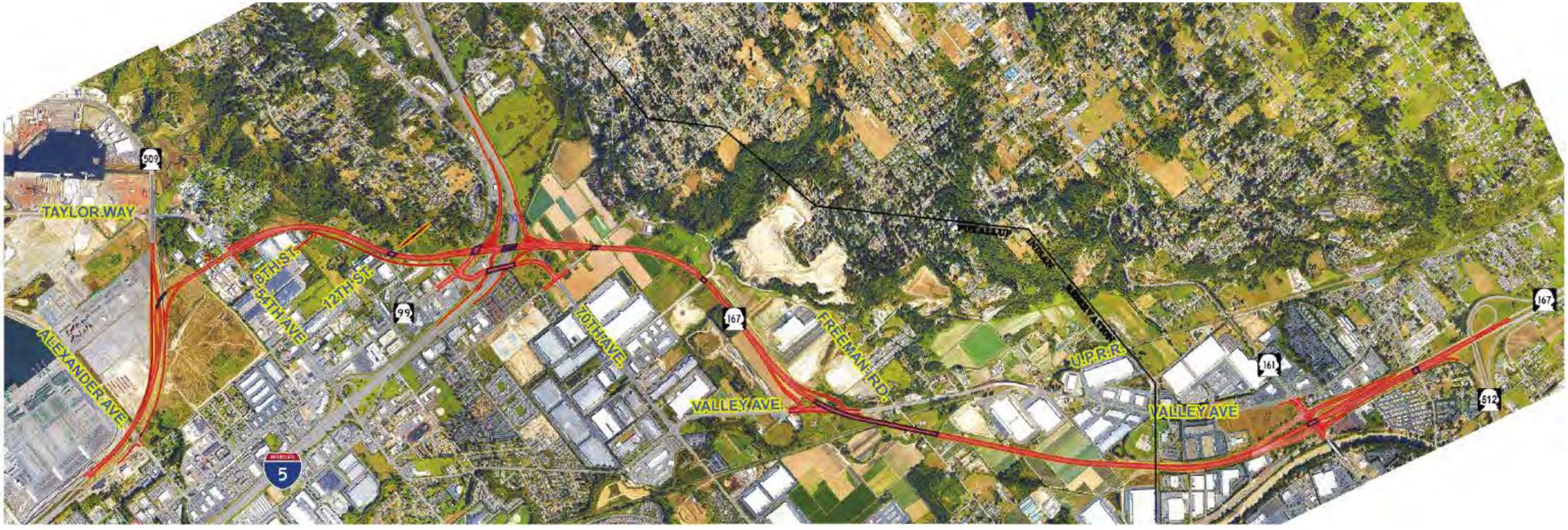
Washington State Department of Transportation (WSDOT). 2016 *Ramp and Roadway Traffic Volume Report*.

Attachments

Attachment A: Schematic Drawing—2006 Build Alternative



Attachment B: Phase 1 Vicinity Map



Attachment C: Gateway Program—SR 167 Completion Work Items 2 and Task 4 Deliverables Technical Memorandum

TECHNICAL MEMORANDUM

Date: August 3, 2016

To: Steve Fuchs, WSDOT

From: Robert Sicko and Ariel Davis, Fehr & Peers

Subject: **Gateway Program – SR 167 Completion Work Items 2 and Task 4 Deliverables**

SE16-0451

INTRODUCTION

Fehr & Peers was selected by the Washington State Department of Transportation (WSDOT) to provide support for traffic modeling and analysis as part of the SR 167 Completion Project. The key components of travel demand modeling support are as follows:

- Prepare 2015, 2025 and 2045 demand model databases to allow various options to be analyzed in support of Practical Design;
- Perform with and without tolling scenarios for the design options identified by WSDOT; and
- Work closely with WSDOT staff to reach agreement on assumptions prior to model runs.

Fehr & Peers recently worked with WSDOT to prepare travel modeling analyses for I-405 Eastside Tolling Corridor and SR 509 Corridor projects. The project team agreed to build on the models previously used for these WSDOT projects, supplemented by additional detail in the transportation network and transportation analysis zone (TAZ) system in the SR 167 study area. This memo provides a summary for the tasks outlined in the approved scope of work, Work Item 2, Demand Modeling and Work Item 4, Methodology and Analysis.

This report begins by describing key components of the development of the I-405 and SR 509 Travel Models which form the foundation of the SR 167 Travel Model. Subsequently, the

modifications made to the SR 167 study area, as well as the scenarios tested and performance metrics extracted are summarized.

SR 509 & I-405 TRAVEL MODEL DEVELOPMENT

The version of the regional travel demand model used for the I-405 and SR 509 projects last year was used to perform travel demand modeling analysis for the SR 167 Completion Project after making appropriate additions and changes relative to the network surrounding the SR 167 study area (Work Item 4.1). The model is based on the Puget Sound Regional Council (PSRC) V1.00b travel model. This section summarizes the background and updates made to that model, based on consultation with PSRC and WSDOT staff.

Land Use

An important input variable for the development of the I-405 and SR 509 travel demand models was an accurate estimate of current land use data (2015) and future year forecasts. Future year land use estimates used the PSRC's Land Use Vision (LUV, January 2016) forecasts to develop total households and total employment allocations that are consistent with County and local jurisdiction land use allocations.

The 2015 base year land use estimates were developed using a variety of data sources. The 2015 total household and total employment data was created at the census tract geography. The following sources were used to develop household and employment estimates:

- 2010 U.S. Census
- Year 2000 thru 2014 building permit data at census tract geography (PSRC)
- 2015 census tract housing data (Office of Financial Management)
- 2015 census tract household size data (PSRC)
- 2014 PSRC employment summaries derived from the Quarterly Census of Employment and Wages (QCEW), administrative records employers report, by law, to the Washington State Employment Security Department (ESD).
- PSRC's supplemental data from the Boeing Company, the Office of Washington Superintendent of Public Instruction (OSPI), and governmental units throughout the central Puget Sound region

The 2025 land use estimates are based on the PSRC's January 2016 Land Use Vision forecasts. Efforts were made to ensure that the growth between the base year (2015) and the 2025 PSRC estimates were logical. Minor adjustments were made to 2015 total household and total employment estimates to minimize illogical growth. The 2015 adjustments were made to Forecast Analysis Zones (FAZs) that did not have an exact equivalency between census tract geographies and FAZ geography.

The PSRC LUV future forecasts extend to year 2040. For this study, a year 2045 land use estimate was required. Working closely with PSRC, the project team developed an estimated land use forecast for 2045. The 2045 forecasts were developed by determining the average annual growth between 2025 and 2040 as well as determining the average annual growth rate between 2035 and 2040. The two growth rates were then averaged and applied to the PSRC 2040 forecasts to extend out an additional five years.

The process used to develop the forecasts was presented to jurisdictional staff within the SR 509 study area. A summary of the base and future year FAZs used in all modeling efforts can be found in **Appendix A**. FAZ boundaries are shown in **Appendix B**.

Model Framework

The I-405 and SR 509 Travel Models were initially developed based on the PSRC's Regional Travel Demand 1K Model, Version 1.00b. The PSRC has extensive model documentation and a User's Guide. Rather than re-write the PSRC documentation, this memorandum summarizes the changes Fehr & Peers made to create the SR 509 travel model, which was then further enhanced to create the SR 167 Travel Model (Task 4.1). These changes include major updates to the following:

- Expansion of TAZ detail from 938 TAZs to 973 TAZs
- Added detail and refined the roadway network in all four counties
- Updated transit network to include current 2015 transit itineraries for King County Metro, Community Transit, and Everett Transit
- Updated park-and-ride component of the model
- Included Tideflats truck trip generation component (special generators)
- Updated demographic inputs from the 2010 Census and employment data from the ESD
- Revised trip generation rates based on the PSRC 2006 Household survey

- Updated assignment methods for traffic, transit, and park-and-ride lots

The following sections describe these items in more detail, including the specific changes that were made to develop the SR 509 travel model, why they are relevant for the model, and provide some details about key input and output files.

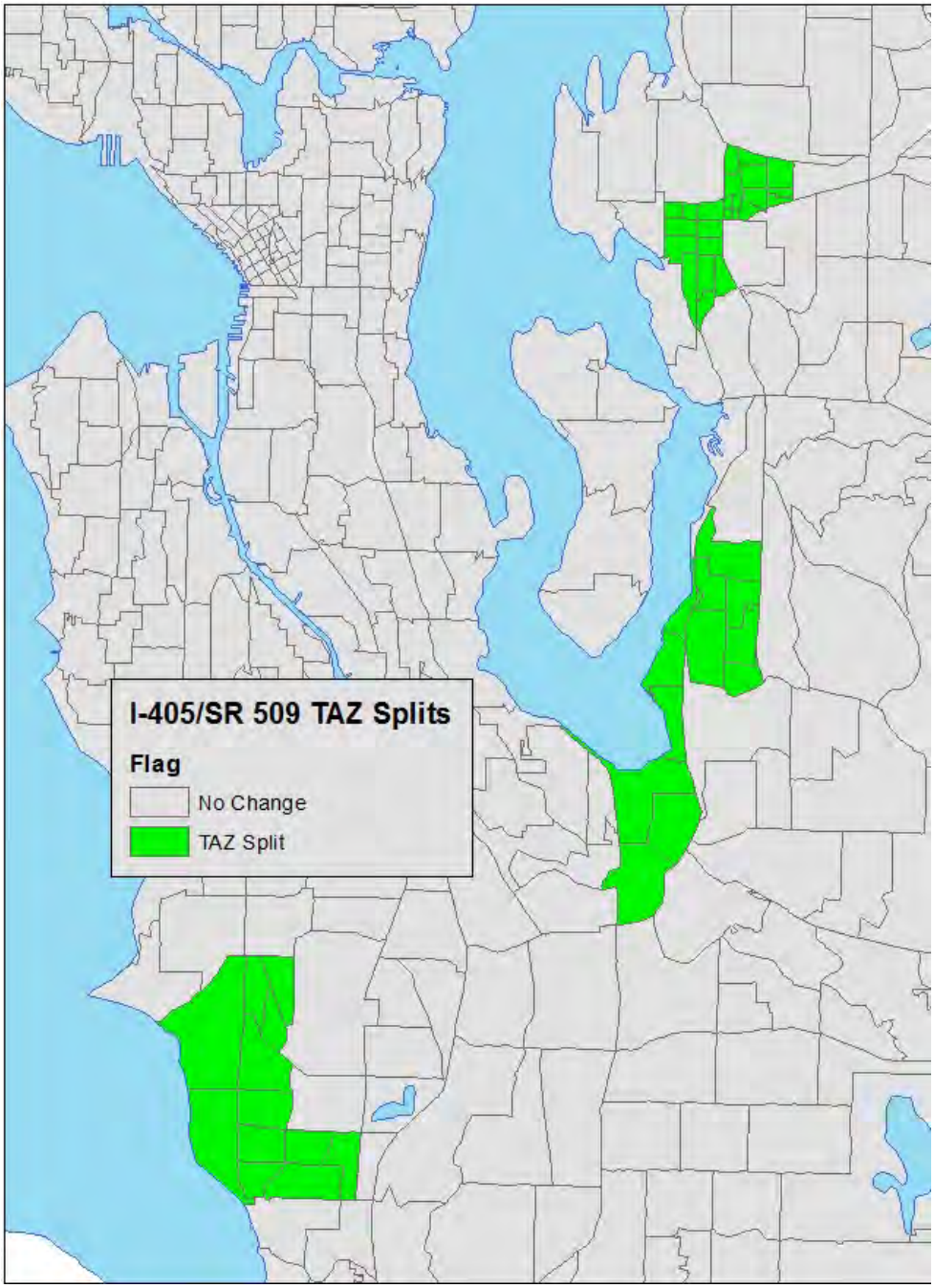
TAZ Updates

TAZs organize land use development data into specific geographic areas. The I-405/SR 509 TAZ equivalencies can be found in **Table 1**. The TAZs that were split for the I-405 and SR 509 modeling are highlighted in **Figure 1.**

Table 1 – I-405/SR 509 TAZ Equivalencies

PSRC TAZ	I-405/SR 509 TAZ
289	289, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 953
291	291, 954, 955, 956
293	293, 952
294	294, 951
295	295, 950
310	310, 957, 958, 959, 960, 961, 962
323	323, 963, 965
324	324, 964
372	372, 970, 971, 972
373	373, 969
374	374, 966, 973
375	375, 967, 969

FIGURE 1: SR 509 & I-405 TAZ SPLITS



Transportation Networks

Highway Network

The highway network developed for the base year SR 509 Travel Model was created by updating the base travel model highway network with additional detail in Snohomish and King County. Much of the highway network modification was done to accommodate the additional TAZs created in the study area. A generalized summary of the modifications made to the SR 509 highway network is shown in **Table 2**.

Table 2 – SR 509 Travel Model Network Modifications

Network Attributes	Modifications
Zone Connectors	The regional TAZs that were split required coding new TAZ connectors to the arterial network. Any TAZ connectors that were connected to intersections were moved to mid-block. Driveway locations were identified with aerial photos and centroid connectors were located appropriately for the small mixed-use center TAZs. Walk access links were added to all regional centers and to park-and-ride lots.
Additional Arterials	Additional base year network detail was added to support the screenline validation effort and future year network assumptions.
Lanes	Modified lanes based on review of aerial photos and field visits. Major changes included coding of center turn lanes (adding 0.2 lanes per the common convention in the area-e.g., a three-lane road is coded as having 1.2 lanes in each direction).
Speed	Speed limits for arterials and collectors in SR 509 and I-405 study area were set to match field conditions.
Capacity	Roadway capacities were modified where appropriate throughout the region (e.g., correcting inconsistent coding from previous modeling efforts.)
Freeway Interchanges	Modified intersection geometries at SR 16 and I-5 interchanges to match actual ramp configurations.
Turn Prohibitions	Added turning restrictions at various locations based on network modifications.
Tolls	Updated SR 16 and SR 520 toll to match current rates. Toll rates are in year 2000 dollars and are a blended rate based on a mix of cash and Good To Go pass usage.

Transit Networks

The transit network and operations inputs for the SR 509 and I-405 Travel Models were updated to reflect 2015 service characteristics (routes and headways) for all transit agencies in the region,



including Sound Transit, Pierce Transit, King County Metro, Community Transit, Kitsap Transit, and Everett Transit. The modifications were made for peak period and off peak service.

The process to determine demand at park and ride lots was also modified. The SR 509 and I-405 travel models incorporated a utility factor to differentiate the attractiveness of a park and ride lot based on transit connectivity and capacity of the lot. The PSRC model does not assume such a factor.

Sociodemographic Data

As described in Chapter 5 of the PSRC model documentation, a key element of the overall model structure is the sociodemographic characteristics of households. This data influences model components such as vehicle availability, mode choice, and trip generation. Version 1.00b of the PSRC model was based on sociodemographic data from the 2000 US Decennial Census. As part of the SR 509 and I-405 Travel Model development, the sociodemographic data were updated using the most recent 2010 Decennial Census data from the US Census Bureau. This data updates the proportions of the households in each of the 256 household cross-classification categories defined in the model.

Trip Generation Rates

In conjunction with the updated sociodemographic information, the PSRC updated the trip generation rates for their trip base models. The primary source of changes in trip rates for households were derived from the 2006 household travel survey. Trip rates for employment were also modified. Summaries of all the trip rate changes can be found in the PSRC publication, *Puget Sound 4K Model Version 4.03, Draft Model Documentation, June 2015*. The new rates have been incorporated into the SR 509 and I-405 Travel Models.

External Trips

The external trips for the travel models were updated to be reflective of the year 2015 traffic counts. The future year external trips are assumed to grow at approximately two percent a year, to be consistent with PSRC's latest regional model.

Special Generators

The travel models for the two projects used similar special generators as the PSRC trip model. The only differences compared to the PSRC's approach to model special generators are as follows:

- The modeling of Sea-Tac International Airport trips was modified to better reflect origins and destinations of trips to and from the airport. PSRC has recently incorporated our modifications as used in the I-405 and SR 509 models.
- The travel models also include Bremerton Navy base and the Snohomish County Boeing facility as special generators.

Transit Assignment

The transit assignment process has been modified from the approach used by PSRC in the regional travel model. The transit assignment methodology used in the SR 509 and I-405 travel models mirrors the methodology used in the Sound Transit Incremental Transit Ridership Model. Specifically, the models incorporate Sound Transit's Boarding Penalty and Wait Time Factors used in the regional transit assignment. The Sound Transit methodology better accounts for passenger bias in selecting both mode and station locations for boarding/alighting based on factors other than transit headways/speeds that are considered in the PSRC V1.00b model framework. To work with the updates in the transit assignment macro, the transit nodes in the network file have been flagged to identify the following, consistent with the Sound Transit methodology:

- Regular bus stops
- Transit centers
- Rail stations (e.g., Sounder, Central and Tacoma Link)

The approach in the Sound Transit model has been approved by the Federal Transit Administration (FTA) and provides greater flexibility in how different stations are represented in the model and more accurately reflects observed boarding and transfer patterns.

Traffic Assignment

Fehr & Peers updated the volume delay functions (VDFs) to improve the performance of the traffic assignment portion of the SR 509 and I-405 Travel Models. The VDFs were developed based on the Highway Capacity Manual's (2000) recommendations for VDFs for large regional travel demand models (Chapter 30 – Area wide Analysis Appendix C). The VDF changes were initially made in conjunction with WSDOT for Fehr & Peers' work on the I-405 Eastside Tolling Corridors project. The VDFs were specifically developed to reduce the PSRC model's tendency to "over-assign" traffic to the freeway corridors compared to adjacent arterial corridors with less congestion. In other words, the standard PSRC VDFs tend to make major regional roadways more



"attractive" compared to typical city arterials and collectors. These VDFs have been used on more than 20 model updates over the past 15 years due to their superior performance for forecasting local traffic patterns. The new VDFs are based on functional class and speed. The VDFs used in the PSRC Version 1.00b and the I-405 and SR 509 travel models are shown in **Table 3**.

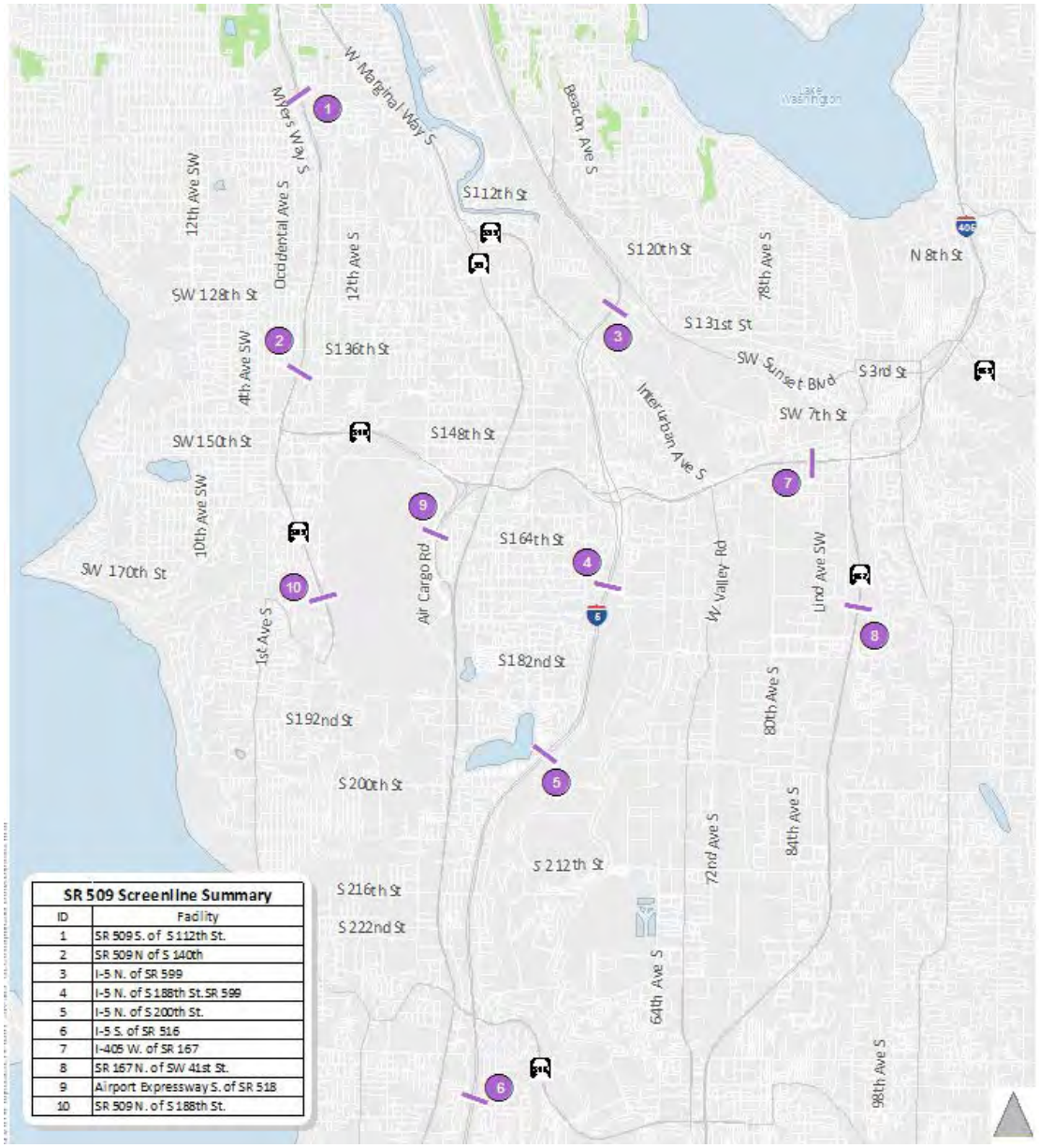
Table 3 –Volume Delay Functions

<table>
<tr><th>Speed (MPH)</th><th>PSRC Version 1.00b</th><th>I-405/SR 509 Travel Model</th></tr>
<tr><td>< 30</td><td rowspan="4">fd5 = (length*60/ul2)*(1+0.60* (HRFAC *volau/ (ul1*lanes))^5.8) +el1/((1-get(1)).max.0.01)</td><td>fd1 =(length*60/ul2)*(1 + 1.5*(HRFAC*(volau) / (lanes*ul1)) ^4)</td></tr>
<tr><td>30</td><td>fd2 =(length*60/ul2)*(1 + 1.2*(HRFAC*(volau) / (lanes*ul1)) ^5)</td></tr>
<tr><td>35</td><td>fd3 =(length*60/ul2)*(1 + 1*(HRFAC*(volau) / (lanes*ul1)) ^ 5)</td></tr>
<tr><td>40</td><td>fd4 =(length*60/ul2)*(1 + 0.7*(HRFAC*(volau) / (lanes*ul1)) ^5)</td></tr>
<tr><td>45</td><td rowspan="2">fd3 = put((length*60/ul2)*(1+0.56*(HRFAC *volau/ (ul1*lanes))^6.0))+length*((0.5639+ put(get(1)/ length)*(0.6398+get(2)*(-0.0712+get(2)* (0.0004+0.00009*get(2))))))</td><td>fd5 =(length*60/ul2)*(1 + 0.72*(HRFAC*(volau) / (lanes*ul1)) ^5)</td></tr>
<tr><td>50</td><td>fd6 =(length*60/ul2)*(1 + 0.74*(HRFAC*(volau) / (lanes*ul1)) ^5)</td></tr>
<tr><td>55</td><td>fd7 =(length*60/ul2)*(1 + 0.1*(HRFAC*(volau) / (lanes*ul1)) ^10)</td></tr>
<tr><td>60</td><td rowspan="2">fd1 = put((length*60/ul2)*(1+0.72*(HRFAC *volau/(ul1* lanes))^7.2))+ length*(0.max.(-.5639+put(get(1)/ length)*(0.6398+get(2)*(-0.0712+get(2)* (0.0004+0.00009*get(2))))))</td><td>fd8 =put((length*60/ul2)*(1 + 0.72*(HRFAC*(volau) / (lanes*ul1)) ^7.2))+length*(0.max.(-0.5639+put(get(1)/length)*(0.6398+get(2)*(-0.0712+get(2)*(0.0004+0.00009*get(2))))))</td></tr>
<tr><td>70</td><td>fd10 =(length*60/ul2)*(1 + .32*(HRFAC*(volau) / (lanes*ul1)) ^7)</td></tr>
<tr><td>Centroid</td><td>fd9 =(length*60/ul2)</td><td>fd9 =(length*60/ul2)*(1 + 1.5*(HRFAC*(volau) / (lanes*ul1)) ^4) or (length*60/ul2)</td></tr>
<tr><td colspan="3">Notes:
fd: Function Definition (part of EMME macro language)
length: Link distance
UL2: Speed in EMME model
HRFAC: EMME Time Period Peak Hour Factor (AM=.375, PM=.35,MD=.184,EV=.354,NI=.255)
Volau: EMME Total Vehicle Demand for Time Period
Lanes: Number of Lanes
UL1: EMME Capacity (vphpl)</td></tr>
</table>

Base Year 2015 SR 509 Travel Model Validation

The SR 509 model validation was done for the AM and PM peak hours. **Figure 4** shows the locations chosen for the validation effort. The observed data was generally obtained from the WSDOT 2015 Compact Data Retrieval (CDR) database.

FIGURE 4: SR 509 VALIDATION LOCATIONS



SR 509 Screenline Summary	
ID	Facility
1	SR 509 S. of S 112th St.
2	SR 509 N of S 140th
3	I-5 N. of SR 599
4	I-5 N. of S 188th St. SR 599
5	I-5 N. of S 200th St.
6	I-5 S. of SR 516
7	I-405 W. of SR 167
8	SR 167 N. of SW 41st St.
9	Airport Expressway S. of SR 518
10	SR 509 N. of S 188th St.

Tables 4a and 4b show the results of the validation for the SR 509 validation locations for the PM peak hour. A model to observed ratio of ten percent is considered a good validation result.

Table 4a – SR 509 Validation results

1: SR 509 S of Cloverdale								
AM	1Hr Est 2015	Observed 2015	Model / Observed		PM	1Hr Est 2015	Observed 2015	Model / Observed
NB	3368	3333	1.01		NB	2785	1800	1.55
SB	1834	1570	1.17		SB	3562	3590	0.99
2: SR 509 N of SW 146th								
AM	1Hr Est 2015	Observed 2014	Model / Observed		PM	1Hr Est 2015	Observed 2014	Model / Observed
NB	2945	3110	0.95		NB	2570	2230	1.15
SB	1673	2060	0.81		SB	3162	3660	0.86
3: I-5 N of SR 599								
AM	1Hr Est 2015	Observed 2015	Model / Observed		PM	1Hr Est 2015	Observed 2015	Model / Observed
NB GP	8122	7000	1.16		NB GP	6185	6030	1.03
NB HOV	2049	1345	1.52		NB HOV	1501	525	2.86
Total	**10171**	**8345**	**1.22**		**Total**	**7686**	**6555**	**1.17**
SB GP	5311	5000	1.06		SB GP	7624	7200	1.06
SB HOV	415	400	1.04		SB HOV	1878	1440	1.30
Total	**5726**	**5400**	**1.06**		**Total**	**9502**	**8640**	**1.10**
4: I-5 N. of S 188th St.								
AM	1Hr Est 2015	Observed 2015	Model / Observed		PM	1Hr Est 2015	Observed 2015	Model / Observed
NB GP	7415	7320	1.01		NB GP	5961	6440	0.93
NB HOV	2088	1475	1.42		NB HOV	1526	475	3.21
Total	**9503**	**8795**	**1.08**		**Total**	**7487**	**6915**	**1.08**
SB GP	5345	5430	0.98		SB GP	7546	7310	1.03
SB HOV	379	225	1.68		SB HOV	1985	1595	1.24
Total	**5724**	**5655**	**1.01**		**Total**	**9531**	**8905**	**1.07**

Table 4b – SR 509 Validation results

5: I-5 S of Military Rd								
AM	1Hr Est 2015	Observed 2015	Model / Observed		PM	1Hr Est 2015	Observed 2015	Model / Observed
NB GP	7703	6700	1.15		NB GP	6035	5000	1.21
NB HOV	1965	1530	1.28		NB HOV	1415	590	2.40
Total	9668	8230	1.17		**Total**	**7450**	**5590**	**1.33**
SB GP	5090	4600	1.11		SB GP	7850	7230	1.09
SB HOV	273	480	0.57		SB HOV	1898	1610	1.18
Total	**5363**	**5080**	**1.06**		**Total**	**9747**	**8840**	**1.10**
6: I-5 S of SR 516								
AM	1Hr Est 2015	**Observed 2015**	Model / Observed		PM	1Hr Est 2015	**Observed 2015**	Model / Observed
NB GP	7288	6500	1.12		NB GP	5660	5255	1.08
NB HOV	1956	1530	1.28		NB HOV	1350	530	2.55
Total	**9244**	**8030**	**1.15**		**Total**	**7010**	**5785**	**1.21**
SB GP	4840	4600	1.05		SB GP	7736	7375	1.05
SB HOV	283	270	1.05		SB HOV	1927	1680	1.15
Total	**5124**	**4870**	**1.05**		**Total**	**9663**	**9055**	**1.07**
7: I-405 W of SR 167								
AM	1Hr Est 2015	**Observed 2015**	Model / Observed		PM	1Hr Est 2015	**Observed 2015**	Model / Observed
EB GP	3224	3650	0.88		EB GP	4784	5080	0.94
EB HOV	1012	425	2.38		EB HOV	1545	860	1.80
Total	**4235**	**4075**	**1.04**		**Total**	**6329**	**5940**	**1.07**
WB GP	4261	4660	0.91		WB GP	4420	4172	1.06
WB HOV	1422	725	1.96		WB HOV	1463	740	1.98
Total	**5684**	**5385**	**1.06**		**Total**	**5883**	**4912**	**1.20**
8: SR 167 S of I-405								
AM	1Hr Est 2015	**Observed 2015**	Model / Observed		PM	1Hr Est 2015	**Observed 2015**	Model / Observed
NB GP	3680	2716	1.35		NB GP	2341	2985	0.78
NB HOV	1984	1395	1.42		NB HOV	1431	480	2.98
Total	**5664**	**4111**	**1.38**		**Total**	**3772**	**3465**	**1.09**
SB GP	2344	2960	0.79		SB GP	2737	3027	0.90
SB HOV	1345	520	2.59		SB HOV	1847	840	2.20
Total	**3689**	**3480**	**1.06**		**Total**	**4584**	**3867**	**1.19**

SR 167 BASE YEAR TRAVEL MODEL DEVELOPMENT AND VALIDATION

The model modifications described in Work Item 2.1 related to the I-405 and SR 509 projects provided the foundation upon which SR 167 study area enhancements were made. This section describes the modifications that were made to enhance the travel model in the SR 167 study area.

Land Use

The base and future year land use estimates, described in Work Item 2.1, were used in the modeling of the SR 167 corridor. The following sections describe the specific changes that were made to develop the "Gateway" travel model (the combined enhanced SR 167 and the SR 509 models), why they are relevant for the model, and provide some details about key input and output files. The process to develop base year and future year land use estimates were presented to staff of the jurisdictions in the SR 167 study area, including the Cities of Tacoma, Fife, Puyallup, and Auburn, Pierce County, and the Port of Tacoma. Staff were given an opportunity to provide feedback on the estimates before the travel modeling was initiated.

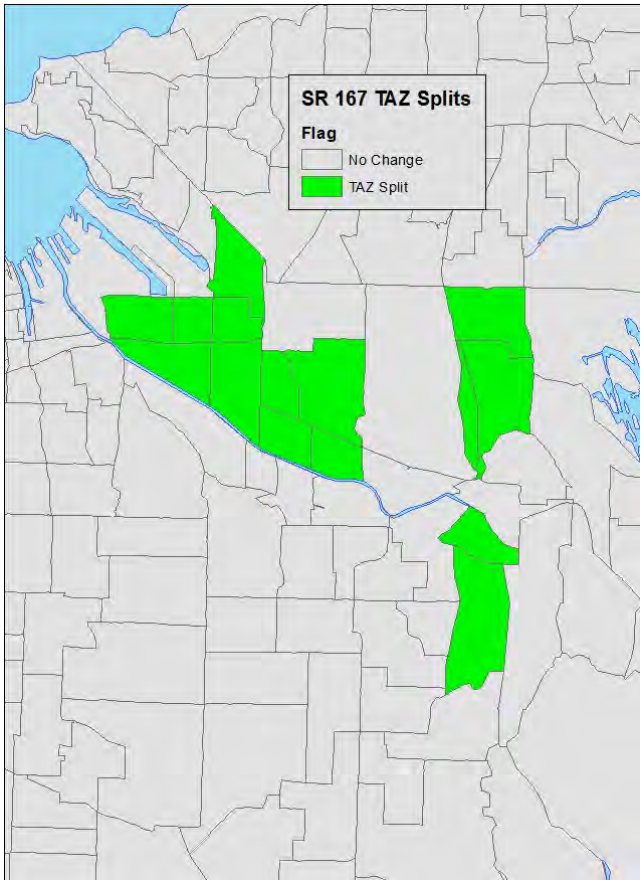
TAZ Updates

TAZs in the SR 167 study area were reviewed for possible modifications. The primary reason TAZs were selected to be split was the distinguishable difference in housing and employment. For example, one half of a TAZ may be mostly housing and the other half all employment. The SR 167 new TAZ equivalencies can be found in **Table 6**. The TAZs that were split for the SR 167 modeling are highlighted in **Figure 5.**

Table 6 – SR 167 TAZ Equivalencies

PSRC TAZ	SR 167 TAZ
761	761, 976
763	763, 978, 979
765	765, 977
768	768, 981
769	770, 975
770	770, 974
781	781, 980

Figure 5 – SR 167 TAZ Splits



Transportation Networks

Highway Network

The highway network developed for the base year SR 167 Travel Model was created by updating the base travel model highway network with additional detail in the SR 167 study area and Pierce County. **Figure 6** provides a comparison of the original transportation network and the modified network used in the SR 167 travel model. The orange links represent roadways that were added or modified, while the green links represent roadways that were deleted from the original network.

FIGURE 6: NETWORK COMPARISON



Transit Networks

The transit network and operations inputs for the SR 167 Travel Model were updated to reflect 2015 service characteristics from Pierce Transit and Sound Transit. Transit itineraries (routes and headways) were modified for all Pierce Transit and Sound Transit routes in Pierce County. The modifications were made for peak period and off peak service. For the future year transit system, Pierce Transit route itineraries were obtained from the PSRC. The PSRC provided analytical support for the Pierce Transit long range plan.

Modeling Methodology

There were no changes made in the modeling approach for the SR 167 travel model. The enhancements made in the study area combined with previous work (SR 509 and I-405) now form the basis for the "Gateway" travel model. The Gateway model was used to extract all of the performance system metrics used in the evaluation of the scenarios.

Base Year 2015 SR 167 Travel Model Validation

The validation effort for the base year SR 167 Travel Model focused on the AM peak hour, PM peak hour and daily travel demand at a collection of screenlines and spot locations in the SR 167 study area. The SR 167 Travel Model does not explicitly generate peak hour volumes; the AM and PM peak three-hour volumes are factored to represent peak hour demand. **Figure 7** shows the screenline and spot locations for which counts were requested and those that were available.

Figure 7: SR 167 Travel Model Screenline and Spot Locations



Figure
Proposed Screenline Locations
SR 167 Completion Project

Table 7a provides a summary of demand for the selected screenlines. Generally, the travel model is performing well in the overall estimation of demand on screenlines 1, 2, and 3. Screenline 4 shows an overestimation of total demand for all time periods.

Table 7a: Observed and Estimated Peak Hour and Daily Screenline Volumes

ID	Location		AM Pk Hr Observed 2015	AM Pk Hr Model	AM Model / Observed	PM Pk Hr Observed 2015	PM Pk Hr Model	PM Model / Observed	ADT Observed 2015	AWDT Model	ADT Model / Observed
Screenline 1: East of I-705/SR 7											
1	SR 509 e/o I-705	EB		3037	-		2618	-	18000	40287	2.24
		WB		2233	-		3258	-	18000	40546	2.25
2	Puyallup Avenue w/o E D St.	EB	391	753	1.93	304	306	1.01	4641	5488	1.18
		WB	292	85	0.29	534	823	1.54	5152	6189	1.20
6	E 56th Street e/o SR 7	EB	275	115	0.42	506	213	0.42	5106	2310	0.45
		WB	352	136	0.39	372	153	0.41	4815	2188	0.45
8	E 84th Street e/o SR 7	EB	213	200	0.94	461	284	0.62	4504	3342	0.74
		WB	289	125	0.43	325	300	0.92	4190	3292	0.79
9	96th Street e/o SR 7	EB	141	124	0.88	194	280	1.44	2876	3044	1.06
		WB	164	387	2.36	368	274	0.75	3454	4608	1.33
Screenline 2: South of SR 512											
1	I-5 s/o SR 512	NB	4532	4541	1.00	5830	4953	0.85	77691	74243	0.96
		SB	5243	3659	0.70	4834	5534	1.14	74760	75178	1.01
2	SR 7 s/o SR 512	NB	1664	1837	1.10	1405	1321	0.94	22406	25952	1.16
		SB	1257	1159	0.92	1944	1919	0.99	21993	26185	1.19
3	Portland Avenue E s/o SR 512	NB		656	-		497	-	6538	8642	1.32
		SB		203	-		765	-	6538	7928	1.21
4	Canyon Road E s/o SR 512	NB		2740	-		1884	-	25063	36693	1.46
		SB		1319	-		2767	-	25063	34279	1.37
7	SR 162 n/o Military Road E	NB	946	746	0.79	577	571	0.99	9932	10206	1.03
		SB	504	439	0.87	1120	854	0.76	10331	10386	1.01
Screenline 3: East of SR 167/Shaw Road											
3	SR 410 s/o SR 167	EB	2812	1757	0.62	2042	2785	1.36	41536	40964	0.99
		WB	1815	2701	1.49	3191	2305	0.72	41545	42192	1.02
4	Pioneer Way E w/o SR 162	EB		123	-		178	-	2638	2357	0.89
		WB		194	-		194	-	2638	2633	1.00
5	Military Road E w/o SR 162	EB		324	-		533	-	4613	6846	1.48
		WB		482	-		573	-	4613	7440	1.61
Screenline 4: North											
1	SR 509 s/o Northpoint Way NE	NB	670	803	1.20	1436	800	0.56	11489	11628	1.01
		SB	1436	783	0.54	1120	947	0.85	12174	12135	1.00
2	SR 99 s/o Johnson Road NE	NB	1040	1987	1.91	919	1570	1.71	5819	26339	4.53
		SB	535	1345	2.51	1854	2272	1.23	12753	27088	2.12
4	SR 161 n/o Military Road S	NB	1215	1501	1.23	656	978	1.49	11612	17865	1.54
		SB	536	647	1.21	1427	1908	1.34	11533	20496	1.78
6	SR 167 n/o 8th Street E	NB		4694	-		3786	-	47050	79382	1.69
		SB		2885	-		5119	-	51560	73806	1.43

Table 7b: Observed and Estimated Peak Hour and Daily Volumes

ID	Location	Direction	AM Pk Hr Observed	AM Pk Hour Model	AM Model/ Observed	PM Pk Hr Observed	PM Pk Hr Model	PM Model/ Observed	ADT Observed	AWDT Model	AWDT Model/ Observed	Count Year
1	I-5 south of S 320th Street	NB	6370	6998	1.10	4710	5405	1.15	80490	114197	1.29	2014
		NB HOV	1100	1608	1.46	680	1288	1.89	10320	20715	1.82	
		SB	4450	4565	1.03	6580	7753	1.18	83330	112533	1.23	
		SB HOV	490	246	0.50	1060	1839	1.74	9150	19329	1.92	
2	SR 161 south of SR 18	NB	1621	1624	1.00	1020	1289	1.26	21629	22165	0.93	2015
		SB	477	842	1.77	1787	1727	0.97	18969	20983	1.01	
3	I-5 south of SR 18											
4	SR 509 west of Taylor Way E	EB		1146			978		11000	14604	1.21	2015
		WB		885			1645		11000	16402	1.36	
5	54th Ave E north of Pacific Hwy E	NB		587		521	668	1.28		9740		2012
		SB		590		793	643	0.81		9856		
6	SR 99 east of 54th Ave E											
7	I-5 east of Port of Tacoma Rd	NB	6447	7319	1.14	5908	7022	1.19	99332	133773	1.36	2015
		NB HOV		1482	-		341	-		14633		
		SB	6028	6470	1.07	6278	9183	1.46	97951	139409	1.29	
		SB HOV		0	-		0	-		0		
8	Port of Tacoma Rd n/o Pacific Hwy E	NB		838		294	886	3.01		13429		2012
		SB		879		663	663	1.00		9264		
9	SR 509 east of I-705											
10	I-705 north of I-5	NB		1163			819	-	13250	12942	0.89	2015
		SB		323			1398	-	13250	12682	0.87	
11	I-5 south of I-705											
12	70th Ave E north of Valley Ave E	NB		417		402	243	0.60		5410		2012
		SB		282		596	434	0.73		6196		
13	Valley Ave E east of 70th Ave E	EB		430		710	632	0.89		9048		2012
		WB		768		355	525	1.48		10612		
14	River Road east of 66th Ave E	EB	739	625	0.85	1160	857	0.74	14593	10571	0.72	2014
		WB	1254	776	0.62	1163	1006	0.86	16062	12433	0.77	
15	Valley Ave E east of Freeman Rd E	EB		456		857	761	0.89		11035		2012
		WB		963		415	603	1.45		12653		
16	N Levee Rd east of Freeman Rd E	EB		53		457	587	1.28		5442		2012
		WB		516		123	61	0.50		3430		
17	SR 161 north of Valley Ave E	NB	1071	1346	1.26	554	766	1.38	9842	15295	1.41	2015
		SB	465	501	1.08	893	1501	1.68	8839	16335	1.68	
18	SR 512 south of SR 167	EB	3391	4003	1.18	2922	3067	1.05	48816	60796	1.13	2015
		WB	2437	2346	0.96	3531	4444	1.26	46442	58668	1.15	
19	SR 410 south of SR 167	NB	2812	2701	0.96	2042	2305	1.13	41536	42192	0.92	2014
		SB	1815	1757	0.97	3191	2785	0.87	41545	40964	0.90	
20	SR 7 n/o 38th Street	NB	1290	1691	1.31	656	883	1.35	11837	18620	1.43	2015
		SB	444	708	1.59	1019	1628	1.60	10502	19452	1.68	
21	SR 167 s/o SR 512	EB	1033	667	0.65	2150	1585	0.74	22809	20853	0.83	2015
		WB	2148	1469	0.68	1407	748	0.53	24404	16738	0.62	

SR 167 TRAVEL MODEL – FUTURE YEAR MODEL DEVELOPMENT

This section documents the modeling process for the future year scenarios. To develop the 2025 and 2045 transportation networks, the project team reviewed the short and long-range plans of WSDOT, PSRC, and jurisdictions throughout the study area to identify projects that are planned to be in place regardless of the final configuration chosen for the I-405, SR 509 or SR 167 Completion Project. The project list has been provided to WSDOT and distributed to the SR 509 and SR 167 Completion Project Steering Committees. The resulting network improvements are considered the No Build scenario.

Five future year scenarios developed by WSDOT were evaluated:

- Scenario 1 – Closing the Gap (Tolled)
- Scenario 2 – Limited Connectivity (Tolled)
- Scenario 3 – Gateway (Tolled)
- Scenario 4 – Moderate Connectivity (Tolled)
- Scenario 5 – Full Build Out (Tolled and No Toll)

Fehr & Peers coded each scenario based on diagrams provided by WSDOT. The key elements of each scenario are summarized in **Table 8**.

Table 8 – SR 167 Scenario Key Interchange Elements

Scenario	Number of Lanes	54th Ave E	I-5	Valley Ave E / Freeman Rd E	SR 161
1 – Closing the Gap	4	No Interchange	Half Interchange to the North	No Interchange	Half SPUI
2 – Limited Connectivity	4	Half SPUI	Half SPUI to the North	Half Interchange to the North	¾ SPUI
3 – Gateway	4	Half SPUI	Half Interchange to the North	Split Interchange at Valley & Freeman	Full SPUI
4 – Moderate Connectivity	4	Half Interchange	Full Interchange to the North	Full Interchange at Valley	Full SPUI
5 – Full Build Out	6	Half SPUI	Full Interchange with HOV	Full Interchange at Valley	Full SPUI

Note that there are other assumptions related to each scenario, for example I-5 auxiliary lanes and HOV lane extensions on existing SR 167 that are not shown above. Complete details may be found in WSDOT's design drawings as provided at the June 28, 2016 Steering Committee, and included in Appendix C.

The SR 509 Project also considered five scenarios ranging from minimal connectivity to full buildout. Each SR 167 scenario was run in tandem with its complementary SR 509 scenario, ranging from the least connectivity to the most connectivity.

Performance metrics

Performance metrics for the SR 167 Completion Project mirror those used for the SR 509 Project. The travel demand model was used to inform the Scenario Comparison Table ratings for the following metrics:

- SR 167 Performance – Maintain or improve SR 167 operations between SR 161 and I-5
- SR 509 Spur Performance – Maintain or improve SR 509 Spur operations between I-5 and SR 509
- I-5 Performance – Maintain or improve I-5 operations between I-705 and SR 18
- Travel Time – Reduce travel time between Urban Centers and Manufacturing Industrial Centers in Pierce and South King County
- Travel Time Reliability – Improve travel time reliability between Urban Centers and Manufacturing Industrial Centers in Pierce and South King County
- Delay – Reduce hours of delay in subarea network

The project team compiled a variety of model output data to address the above metrics. Because the output is voluminous, it is not reproduced in full within this memo. Each type of output is described below and full spreadsheets were provided to WSDOT staff. In consultation with WSDOT staff, key summaries and illustrative data were selected for presentation to the Steering Committee on June 28, 2016. Those summaries are included below.

SR 167, SR 509 Spur and I-5 Performance

Performance on SR 167, I-5 and the SR 509 Spur was evaluated based on several metrics: auto volume, speed, and volume-to-capacity ratio. Data was extracted for both general purpose and HOV lanes for the AM and PM peak hours. Five segments along I-5 were studied: south of SR 18, south of SR 167, south of 54th Avenue E, south of Port of Tacoma Road, and south of E Bay Street.

Mobility- SR 509 Spur/SR 167 Performance

Throughput potential and congestion were evaluated for 2025 southbound PM Conditions

SR 509 Spur & 167 Performance 2025 PM Southbound	SR 509 Spur	SR 167		
	GP	GP	HOV	Total
S1	260	800	0	800
S2	370	1130	0	1130
S3	360	1030	0	1030
S4	620	1840	0	2210
S5	620	1830	760	2570
S5 Free	1740	3350	650	4000

SR 167: Auto/Freight

Scenario 1: 

Scenario 2: 

Scenario 3: 

Scenario 4: 

Scenario 5: 

SR 509: Spur Auto/Freight

Scenario 1: 

Scenario 2: 

Scenario 3: 

Scenario 4: 

Scenario 5: 

SR 167: HOV/Bus

Scenario 1: 

Scenario 2: 

Scenario 3: 

Scenario 4: 

Scenario 5: 

SR 509 Spur: HOV/Bus

Scenario 1: 

Scenario 2: 

Scenario 3: 

Scenario 4: 

Scenario 5: 

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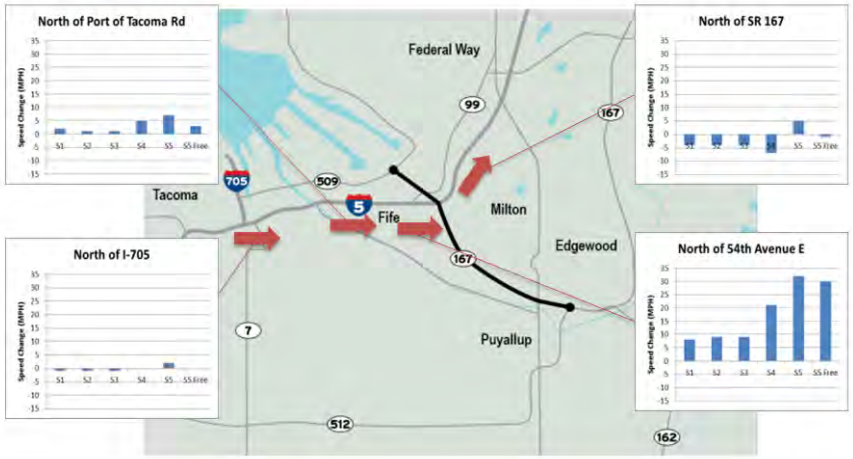
WSDOT

Mobility: I-5 Performance

I-5 Performance Northbound AM, 2025

I-5 model projected speeds were evaluated at several screenline locations



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WSDOT

Mobility: I-5 Performance

I-5 Performance Southbound PM, 2025

I-5 model projected speeds were evaluated at several screenline locations

I-5 Auto/Freight

Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:

I-5 HOV/Bus

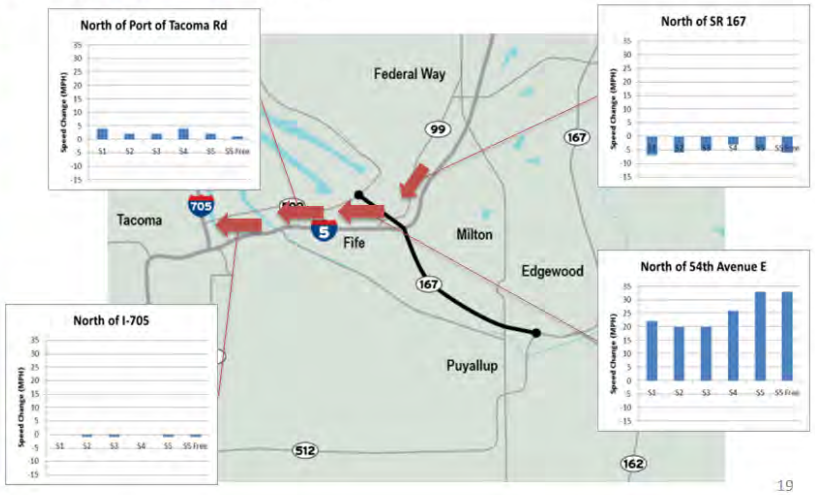
Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:



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WSDOT

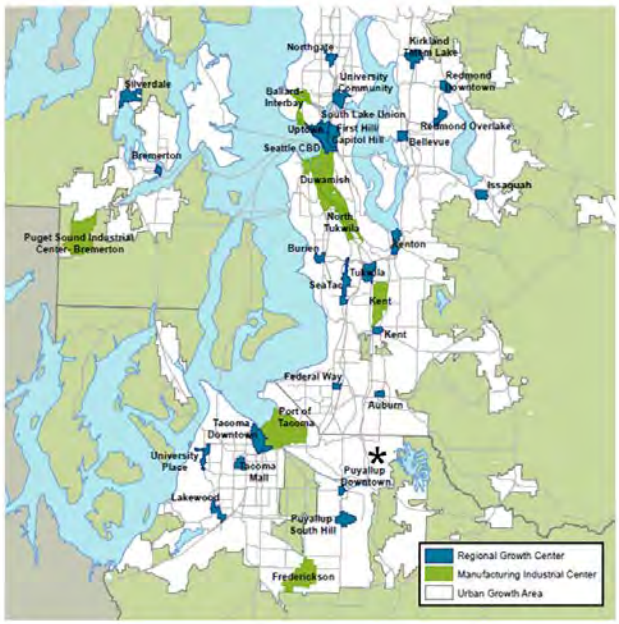
Regional Growth Center Travel Time Analyses

The project team produced tables summarizing travel time data between eight Regional Growth Centers. The RGCs were selected in consultation with WSDOT and included:

- Federal Way
- Auburn
- Sumner/Pacific
- Puyallup Downtown
- Puyallup South Hill
- Frederickson
- Port of Tacoma
- Tacoma Downtown

For each origin-destination pair, the RGC analysis provided the number of trips, average congested travel time and free-flow travel time. The ratio of the congested travel time to the free-flow time was used to approximate travel time reliability. The difference between congested travel times among scenarios was provided to estimate how each scenario would perform for all origin-destination pairs.

Travel Time Between Centers



- Federal Way
- Auburn
- Sumner/Pacific* (Proposed)
- Puyallup Downtown
- Puyallup South Hill
- Fredrickson
- Port of Tacoma
- Tacoma

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WSDOT

Mobility: Travel Time Between Centers

Each trip between the 8 centers were evaluated for each scenario, for AM & PM and for 2025 and 2045 to determine where changes occurred compared to no build. Two example charts of time savings in minutes are shown:

2025 S1 PM — 2025 PM Scenario 1

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Fredrickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	0.5	1.5	1.5	1.5	1	1.5
Auburn	0		0.5	1	0.5	0	1	1.5
Sumner / Pacific - Proposed	0	0		0	0	0	0.5	0.5
Puyallup Downtown	0	0	0		0	0	0.5	0
Puyallup South Hill	0.5	0	0	0		0	0.5	0
Fredrickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	0	0.5	0		+0.5
Tacoma Downtown	0	0	0	0	0	0	0	

2025 S5 PM — 2025 PM Scenario 5

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Fredrickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	1	2.5	2.5	2	1.5	2
Auburn	0		1	2	1.5	0	2	2
Sumner / Pacific - Proposed	0	0		0.5	0.5	0	1	0.5
Puyallup Downtown	1	0	0		0	+0.5	0.5	0
Puyallup South Hill	1	0	0	0		+0.5	0.5	0
Fredrickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	1	1.5	0		+0.5
Tacoma Downtown	0	0	0	0.5	0	0	0	

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WSDOT

Mobility- Travel Time Between Centers

PM travel time changes between Auburn and the Port of Tacoma versus the No Build condition

Auburn to Port of Tacoma Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	↓ 1	↑ 0.5
S2	↓ 1	↑ 0.5
S3	↓ 1	↑ 0.5
S4	↓ 2.5	0
S5	↓ 2	↓ 1
S5 Free	↓ 2	0



WSDOT

Mobility: Travel Time Between Centers

PM Travel time changes between Federal Way and the Port of Tacoma versus the No Build condition

Federal Way to Port of Tacoma Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	↓ 1	0
S2	↓ 1	↑ 0.5
S3	↓ 1	↑ 0.5
S4	↓ 3	0
S5	↓ 1.5	0
S5 Free	↓ 1.5	↑ 1

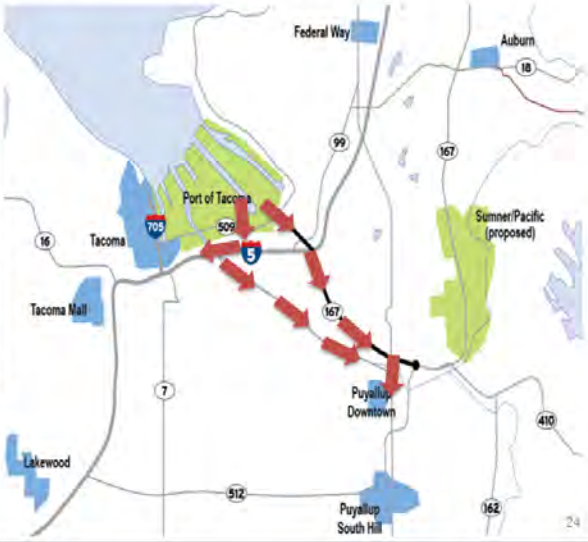


WSDOT

Mobility: Travel Time Between Centers

PM Travel time changes between the Port of Tacoma and Puyallup Downtown versus the No Build condition

Port of Tacoma to Puyallup Downtown Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	0	0.5
S2	0.5	2
S3	1	2
S4	1	3
S5	1	2.5
S5 Free	2.5	4



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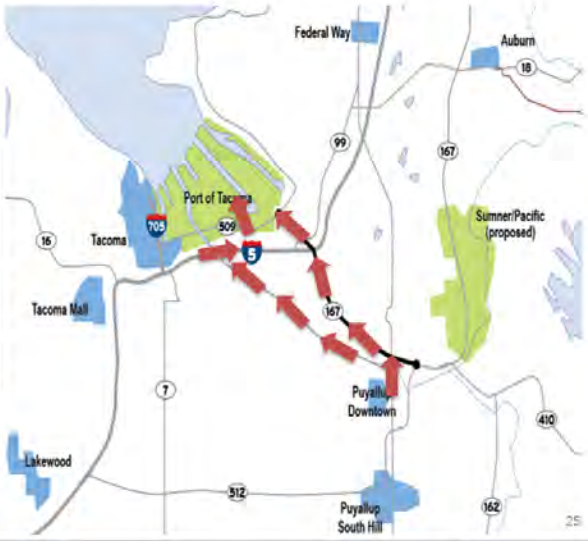
WSDOT

Mobility: Travel Time Between Centers

AM Travel time changes between Puyallup Downtown and the Port of Tacoma versus the No Build condition

Puyallup Downtown to the Port of Tacoma Travel Time Savings (minutes)		
	2025 AM	2045 AM
S1	0	1
S2	0.5	0.5
S3	0.5	0.5
S4	0.5	1
S5	1	1
S5 Free	2	2



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WSDOT

Mobility: Travel Time Between Centers

Each trip between the 8 centers were evaluated for each scenario, for AM & PM and for 2025 and 2045 to determine where changes occurred compared to no build. Two example charts of time savings in minutes are shown:



2025 PM Scenario 1	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	0.5	1.5	1.5	1.5	1	1.5
Auburn	0		0.5	1	0.5	0	1	1.5
Sumner / Pacific - Proposed	0	0		0	0	0	0.5	0.5
Puyallup Downtown	0	0	0		0	0	0.5	0
Puyallup South Hill	0.5	0	0	0		0	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	0	0.5	0		-0.5
Tacoma Downtown	0	0	0	0	0	0	0	

2025 PM Scenario 5	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	1	2.5	2.5	2	1.5	2
Auburn	0		1	2	1.5	0	2	2
Sumner / Pacific - Proposed	0	0		0.5	0.5	0	1	0.5
Puyallup Downtown	1	0	0		0	-0.5	0.5	0
Puyallup South Hill	1	0	0	0		-0.5	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	1	1.5	0		-0.5
Tacoma Downtown	0	0	0	0.5	0	0	0	

Auto/Freight

- Scenario 1:
- Scenario 2:
- Scenario 3:
- Scenario 4:
- Scenario 5:

HOV/Bus

- Scenario 1:
- Scenario 2:
- Scenario 3:
- Scenario 4:
- Scenario 5:

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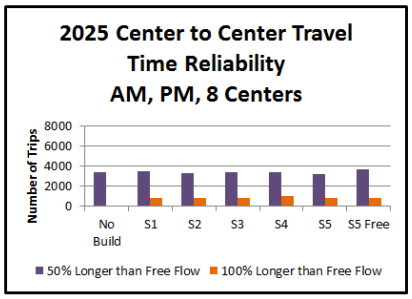
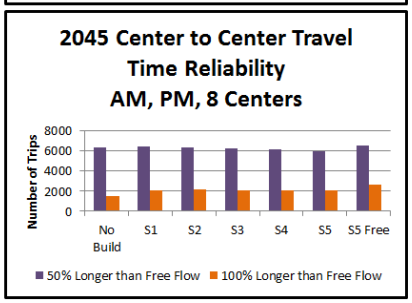
WSDOT

Mobility: Reliability Between Centers





- Travel time 50% longer than free flow and twice as long as free flow were evaluated
- Results of all trip pairs

Scenario 1: Moderate
Scenario 2: Moderate
Scenario 3: Moderate
Scenario 4: Moderate
Scenario 5: Moderate

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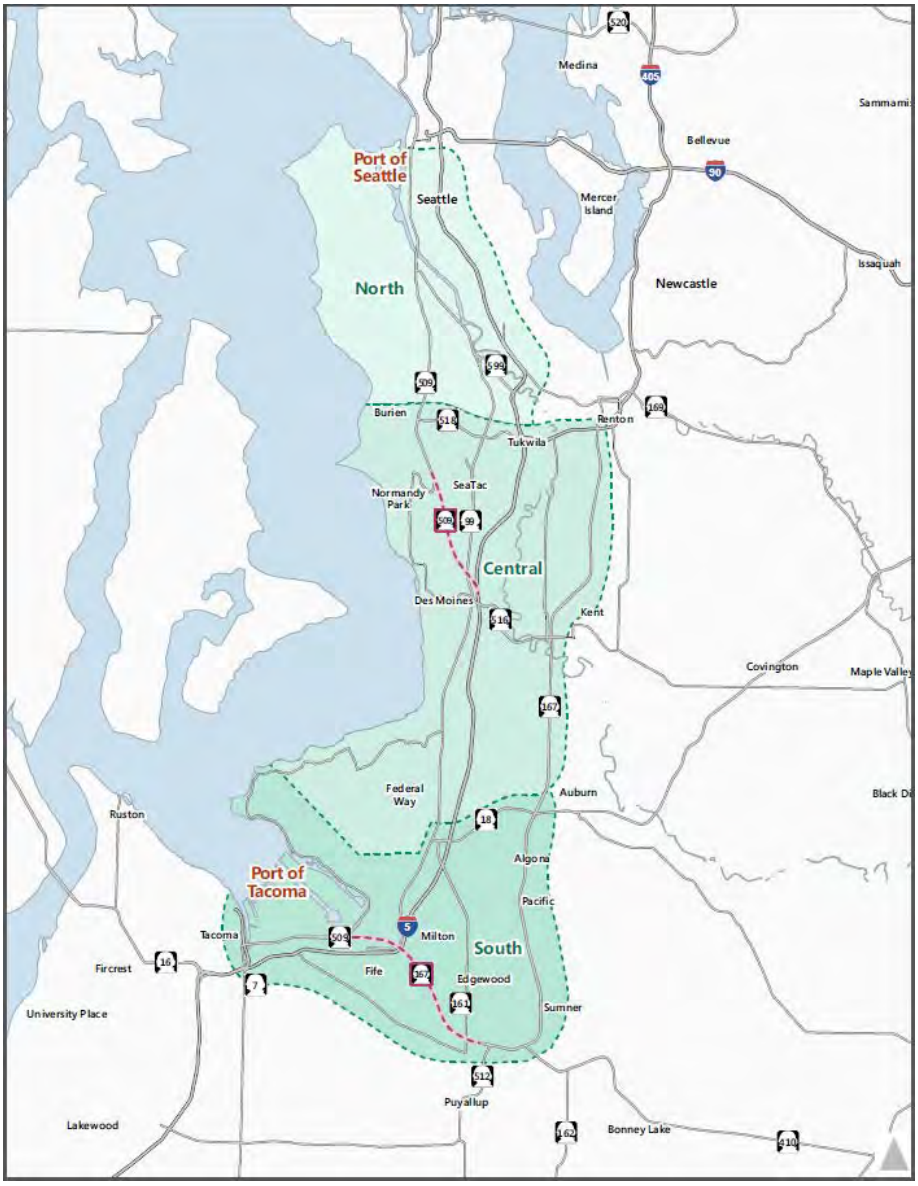
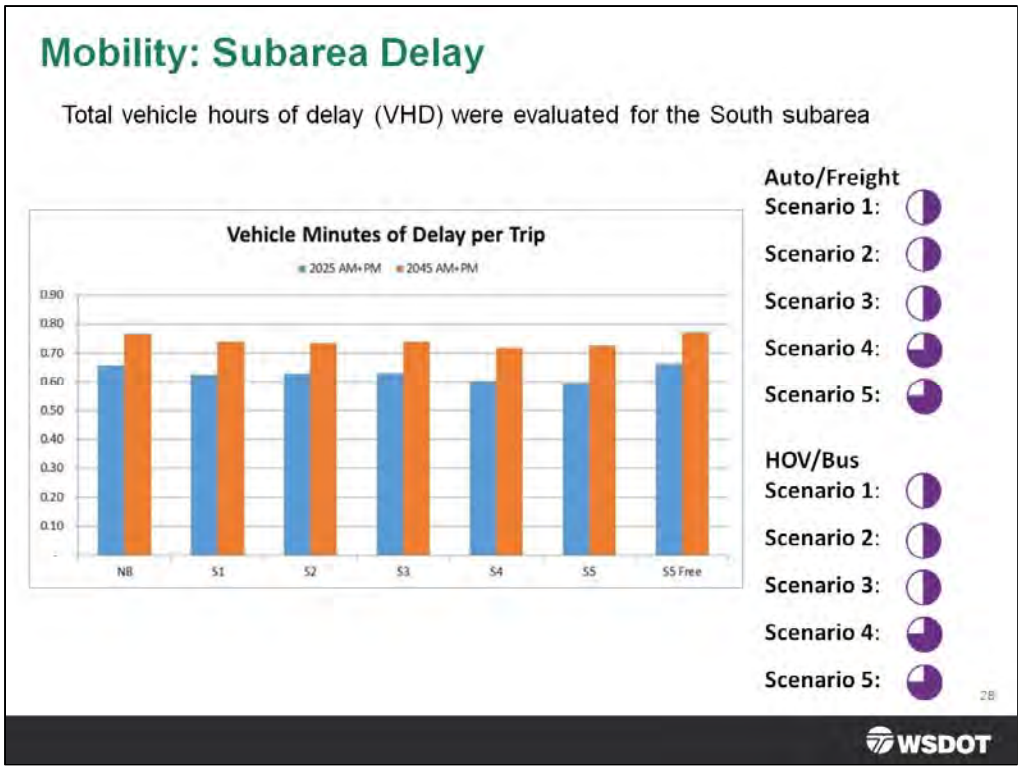
WSDOT

Subarea Trips, Vehicle Miles Travelled, and Vehicle Hours of Delay

Three subareas were identified as part of the Gateway project: North, Central, and South as shown in **Figure 8** on this page. For the SR 167 Completion Project, the focus was on the South subarea. The number of trips, vehicle miles travelled (VMT), vehicle hours of delay (VHD) were extracted from the model for the South subarea.

Figure 8: Gateway Project Subareas





CONCLUSION

This travel demand modeling effort was used to expand the SR 509 demand model into one large comprehensive model that represents the entire Puget Sound Gateway program. The results of this effort provided high-level information to both the SR 509 and SR 167 design teams and was presented to their respective Steering Committees. Consequently, these performance metrics allowed for some initial screening of the scenarios from five down to three at Steering Committee meeting #3 for each project respectively. Further refinement of this travel demand model is expected in support of the next level of traffic modeling, which will be the development of a Dynamic Traffic Assignment (DTA) model by Parsons Brinckerhoff to help with the selection of a preferred scenario. Fehr & Peers is glad to provide further assistance in refining the travel demand model for this very important program.

Appendix A: 2015, 2025 and 205 FAZ Land Use Estimates

	2015		2025		2045	
FAZ	Households	Employment	Households	Employment	Households	Employment
110	1,957	794	2,678	818	3,142	993
120	4,356	1,061	5,537	1,201	5,667	1,333
135	6,134	2,207	7,959	2,398	9,596	2,644
136	4,569	4,058	5,427	3,229	6,428	3,536
205	5,445	10,812	5,708	11,548	7,924	17,829
206	5,183	6,626	6,617	8,457	13,215	16,388
315	5,487	5,435	5,643	5,796	5,539	6,096
325	9,125	5,832	10,198	6,578	8,931	5,851
405	8,818	3,389	9,331	3,578	8,505	3,289
505	16,150	10,876	20,030	12,370	19,130	15,757
506	8,387	4,270	10,961	4,700	13,745	4,685
605	7,512	3,602	9,860	4,688	9,038	4,514
606	7,490	3,908	8,860	4,137	9,735	4,222
705	6,992	2,448	10,938	3,935	13,188	4,669
706	4,527	3,201	5,744	3,707	6,605	3,766
805	6,954	4,732	8,450	5,305	9,562	5,279
806	11,618	3,893	12,586	3,805	14,123	4,052
900	4,034	16,108	5,165	18,707	5,810	15,807
1000	3,520	1,823	4,389	3,332	3,990	2,789
1115	4,374	5,105	5,389	4,812	7,363	5,717
1116	5,761	6,946	7,760	8,431	14,079	14,548
1120	12,439	12,912	14,548	13,923	17,858	17,258
1130	1,889	5,227	3,005	5,078	3,277	5,877
1200	6,412	4,329	7,944	5,457	9,321	5,627
1310	9,377	4,914	11,592	5,774	13,591	13,066
1320	6,628	3,614	7,494	4,531	9,345	6,355
1330	7,326	4,928	9,741	5,398	11,458	5,850
1410	4,992	11,330	8,068	12,156	10,895	17,600
1420	4,311	13,243	9,052	16,604	16,902	34,715
1505	8,195	4,987	9,511	6,090	12,601	7,721
1506	8,767	3,472	10,863	3,421	15,855	4,842
1605	7,832	6,263	8,322	6,686	9,678	13,098
1606	5,747	1,929	5,857	2,523	7,005	3,243
1710	8,516	11,048	12,778	11,827	17,151	22,134

	2015		2025		2045	
FAZ	**Households**	**Employment**	**Households**	**Employment**	**Households**	**Employment**
1720	10,338	5,413	13,478	5,981	15,968	7,376
1810	1,845	13,285	6,569	15,776	14,460	22,785
1820	4,398	19,289	4,897	23,660	9,093	30,863
1900	428	10,944	547	12,079	940	17,737
2000	4,270	14,597	5,195	15,436	7,292	17,745
2100	6,919	1,693	8,343	2,134	9,752	2,361
2215	6,852	6,114	7,729	6,788	7,031	6,932
2216	6,781	3,259	7,654	3,937	7,947	3,545
2225	6,090	6,260	7,716	7,171	8,267	6,543
2910	1,255	476	1,347	612	1,459	741
2925	5,756	1,299	6,632	2,058	7,464	2,429
2926	8,972	2,136	9,327	2,351	9,902	2,938
2927	2,447	1,277	2,837	2,003	3,648	2,497
2935	3,886	54,451	6,651	57,481	6,886	61,728
2936	3,527	3,453	4,716	4,491	5,823	4,291
2940	5,746	1,883	6,273	2,767	6,802	2,941
3010	14,861	8,641	16,410	9,212	16,705	9,250
3020	9,288	19,081	12,738	23,974	16,862	31,306
3030	12,340	9,994	15,866	13,492	17,526	15,579
3045	10,241	2,746	12,219	3,559	12,639	3,589
3046	9,225	6,969	10,560	9,234	12,034	11,459
3110	3,151	3,117	3,252	3,341	3,306	3,790
3120	9,205	18,876	10,247	20,234	11,255	25,157
3130	6,983	22,143	7,816	27,077	8,561	32,345
3200	7,187	6,867	8,343	6,939	8,840	7,084
3310	6,810	2,850	8,567	3,725	9,403	5,120
3320	10,206	5,267	11,760	6,391	12,731	7,378
3330	4,655	1,497	5,379	1,817	6,122	1,686
3413	2,965	1,198	3,526	1,505	4,203	1,245
3414	8,531	2,390	10,051	2,721	10,329	3,005
3415	8,915	3,567	11,209	4,723	12,872	4,840
3416	8,714	2,613	10,018	3,529	10,109	3,207
3425	6,402	2,795	8,032	3,180	9,767	3,528
3426	6,102	2,824	7,816	2,976	9,213	3,190
3427	8,030	5,653	9,492	5,958	10,259	7,240
3505	14,862	17,100	17,213	21,035	19,191	26,435

	2015		2025		2045	
FAZ	Households	Employment	Households	Employment	Households	Employment
3600	8,523	48,963	8,828	57,765	9,981	66,274
3705	11,484	32,378	15,446	47,203	18,827	76,669
3706	6,140	3,155	6,873	3,272	7,832	4,874
3815	7,942	8,976	8,918	9,053	10,651	11,719
3816	8,071	3,949	10,153	7,870	9,474	5,505
3825	6,588	7,208	7,451	7,729	8,536	8,753
3900	2,761	20,342	3,670	21,567	4,752	25,945
3905	3,331	20,276	4,027	21,459	4,514	26,663
4005	4,713	1,464	5,887	2,013	6,646	2,156
4110	7,310	34,880	9,577	36,981	11,893	39,703
4120	8,236	2,971	9,556	4,793	10,244	10,361
4130	8,797	26,067	9,871	29,669	11,074	35,215
4210	8,989	4,358	11,185	6,371	12,302	10,038
4225	6,696	2,810	7,053	3,042	7,333	3,176
4226	6,136	3,245	7,121	7,109	7,459	3,239
4230	3,577	1,914	4,230	1,980	4,598	1,567
4300	4,489	9,697	6,122	20,324	7,542	24,888
4400	9,433	7,896	10,569	9,031	12,131	9,889
4505	5,505	1,000	5,546	1,415	5,355	1,704
4506	6,654	30,607	7,623	31,483	8,920	36,296
4605	9,547	15,467	11,465	15,449	12,249	20,873
4606	8,614	3,197	9,465	3,093	10,210	3,477
4607	9,726	9,705	9,818	5,967	10,822	10,927
4706	5,263	1,756	5,753	3,109	6,082	2,568
4810	4,418	6,035	4,441	9,070	4,825	9,889
4820	3,502	5,668	2,968	5,147	2,983	6,118
4900	6,115	45,012	9,024	51,067	14,496	79,248
5010	8,332	10,997	8,735	12,279	9,745	16,100
5020	10,205	7,666	11,095	7,819	12,037	7,938
5100	2,635	1,216	3,311	1,557	3,358	1,575
5205	5,517	29,892	11,689	38,128	13,569	46,097
5305	12,147	23,250	14,423	26,853	15,388	33,591
5306	10,071	17,340	11,040	21,361	12,463	28,891
5415	5,746	47,345	7,030	60,188	11,004	65,227
5425	17,569	29,200	20,614	31,655	23,582	40,253
5426	8,288	14,696	9,512	15,932	10,267	17,445

	2015		2025		2045	
FAZ	**Households**	**Employment**	**Households**	**Employment**	**Households**	**Employment**
5515	9,945	4,571	11,411	4,814	12,495	5,455
5525	5,816	5,322	6,346	7,325	7,726	7,431
5535	9,322	4,202	12,653	6,842	15,247	10,997
5545	4,786	4,030	6,123	4,623	6,710	4,094
5546	5,778	11,342	7,108	14,589	8,382	17,836
5600	6,136	13,767	7,472	14,128	8,996	16,818
5715	7,533	1,750	8,321	2,150	8,512	2,655
5716	10,513	7,296	12,155	8,107	13,701	7,626
5720	19,083	9,921	19,897	12,528	21,466	13,672
5815	1,985	24,656	2,356	24,971	2,621	23,084
5825	1,190	43,257	2,220	43,809	3,554	48,522
5826	2,697	7,070	2,770	7,160	2,889	6,819
5915	7,003	4,382	8,305	4,826	8,851	5,398
5916	14,469	6,977	15,367	7,683	17,080	7,791
5925	11,576	14,097	11,584	18,830	12,547	23,512
6010	9,102	118,755	11,985	119,868	17,442	154,031
6020	13,905	54,543	20,736	55,054	28,687	82,270
6113	21,698	42,437	29,199	43,889	34,268	49,452
6114	16,882	18,318	18,186	20,585	19,565	21,430
6115	10,777	7,499	11,886	10,199	12,323	10,136
6123	14,308	68,930	17,553	69,576	27,236	85,699
6124	13,930	13,304	15,331	13,581	15,806	13,271
6125	5,512	8,748	5,567	13,616	5,600	16,074
6126	5,454	2,660	5,809	2,899	5,913	2,917
6213	10,592	16,198	10,496	17,730	10,891	16,611
6214	196	27,842	238	27,242	238	26,486
6215	13,913	13,349	13,032	13,532	15,572	15,680
6216	6,400	11,509	7,186	9,528	7,112	12,607
6223	13,441	6,474	13,969	8,027	16,397	8,007
6224	11,244	7,497	10,643	6,781	10,816	7,485
6225	10,402	15,125	11,327	16,856	14,898	26,741
6226	13,441	5,334	14,700	6,413	14,902	6,673
6316	17,012	20,201	20,460	20,362	21,661	18,824
6325	16,395	6,969	17,382	7,319	17,859	7,015
6326	11,585	10,639	12,918	11,506	13,718	10,929
6410	14,936	12,251	16,849	16,265	17,771	21,658

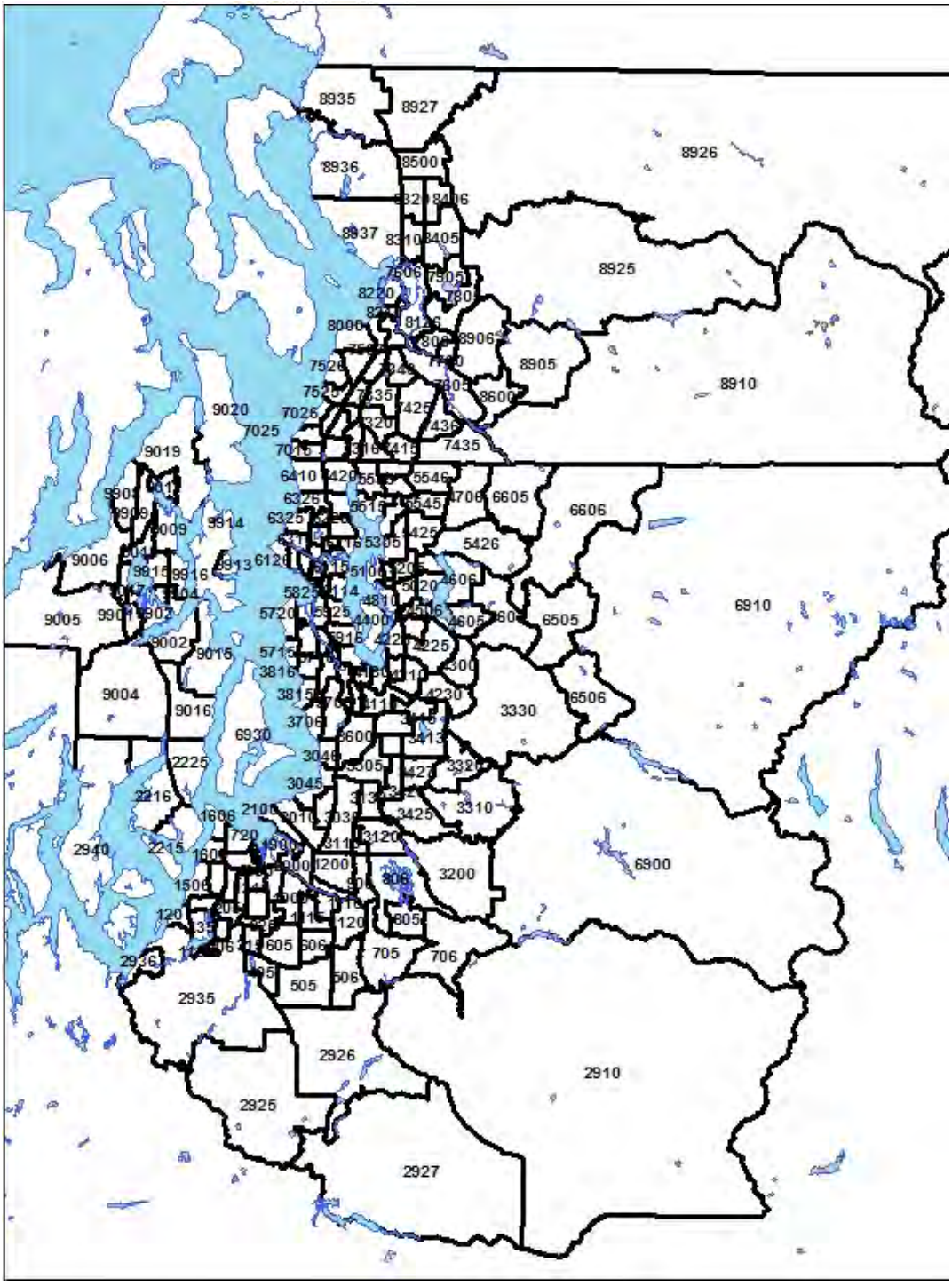


	2015		2025		2045	
FAZ	**Households**	**Employment**	**Households**	**Employment**	**Households**	**Employment**
6420	12,823	8,128	14,519	8,590	17,454	8,887
6505	5,439	3,850	5,662	4,267	5,787	4,230
6506	4,860	5,135	5,023	5,224	5,226	6,402
6605	4,325	2,376	5,065	2,661	5,525	3,019
6606	1,919	1,293	2,429	1,552	2,992	1,944
6900	2,950	1,227	3,577	1,695	4,079	1,759
6910	2,553	2,275	3,086	2,314	3,726	2,404
6930	4,619	2,767	4,793	3,953	4,828	4,081
7015	7,087	4,212	9,303	5,703	11,246	5,966
7025	8,909	9,255	9,223	9,286	11,188	9,330
7026	3,700	1,107	5,076	1,799	4,630	1,243
7100	8,486	7,980	10,237	9,638	11,884	9,794
7205	5,557	6,329	6,621	6,656	7,269	10,037
7206	7,455	12,514	9,101	17,136	14,071	23,630
7315	6,103	3,903	7,184	4,235	8,394	4,030
7316	7,718	3,475	9,230	4,628	9,958	4,925
7320	12,563	7,373	13,439	7,604	15,867	8,012
7335	14,994	11,073	15,715	11,519	16,716	10,978
7340	9,589	3,208	11,332	3,230	11,248	3,199
7415	4,632	12,925	5,687	13,929	6,514	14,745
7425	10,545	3,624	13,886	4,454	15,618	4,226
7435	2,810	3,539	3,112	5,141	3,351	3,572
7436	2,088	2,320	2,236	2,421	2,299	1,519
7515	2,444	7,743	3,672	8,382	4,807	11,179
7525	5,871	1,751	6,655	2,085	7,705	2,812
7526	6,382	8,784	6,646	9,389	6,814	9,088
7535	10,124	6,501	11,012	6,949	13,566	8,475
7537	8,933	18,768	10,275	19,606	13,234	25,317
7605	710	881	754	1,007	783	769
7606	1,239	691	2,139	1,650	2,628	3,044
7700	3,295	3,739	3,625	3,896	3,749	7,674
7805	7,326	2,258	8,656	2,727	10,447	2,158
7806	1,691	1,530	2,624	1,605	3,965	1,768
7905	7,991	4,068	10,504	6,703	13,383	7,432
8000	5,089	47,369	5,595	47,819	6,114	48,029
8115	11,452	9,359	12,491	10,422	15,086	12,790

	2015		2025		2045	
FAZ	**Households**	**Employment**	**Households**	**Employment**	**Households**	**Employment**
8125	6,594	5,406	7,957	5,544	9,977	8,087
8126	5,105	5,387	5,814	5,542	7,049	9,597
8210	4,237	14,966	9,062	21,114	15,179	43,338
8220	7,479	14,467	12,456	19,474	17,554	33,511
8310	11,303	8,209	13,859	10,704	16,619	16,938
8320	4,779	6,632	5,110	9,831	5,746	12,025
8405	5,395	942	6,926	1,473	8,863	1,300
8406	591	141	638	323	889	477
8500	6,913	8,414	8,864	11,572	10,655	18,047
8600	5,924	9,598	6,997	11,076	8,092	12,301
8905	3,550	655	3,745	1,284	4,106	670
8906	3,064	1,343	3,285	1,400	3,614	1,539
8910	5,392	1,810	6,646	1,892	8,291	5,809
8925	5,196	2,376	6,843	2,612	9,481	5,169
8926	5,179	1,357	6,245	1,492	7,416	1,928
8927	2,042	821	2,224	902	2,522	1,037
8935	4,635	4,176	5,843	4,429	7,776	8,706
8936	6,385	3,208	7,540	4,529	8,379	4,191
8937	3,920	8,667	6,102	8,234	8,278	11,214
9002	9,442	8,105	14,067	9,547	16,290	13,660
9004	7,125	3,601	8,091	5,157	8,806	7,555
9005	2,176	223	2,615	439	2,922	329
9006	3,720	1,281	4,511	1,335	6,114	3,846
9009	1,952	2,440	2,255	3,671	2,398	2,038
9011	3,878	5,350	4,411	6,164	5,174	8,936
9015	5,399	1,023	6,649	2,730	6,874	1,321
9016	4,247	1,717	5,069	2,078	5,445	1,601
9017	1,314	122	1,883	627	2,251	407
9018	6,019	11,258	6,186	12,953	10,778	19,453
9019	6,248	4,589	8,022	6,098	8,355	5,298
9020	6,151	3,084	8,655	3,347	9,576	3,395
9900	2,964	1,264	3,326	1,757	5,221	2,040
9901	2,419	3,254	2,940	3,707	7,800	4,129
9902	9,351	25,962	11,079	29,610	17,358	38,556
9904	4,725	5,330	5,580	7,204	7,304	8,468
9908	1,191	7,226	1,212	6,324	1,112	6,231

	2015		2025		2045	
FAZ	**Households**	**Employment**	**Households**	**Employment**	**Households**	**Employment**
9909	1,717	925	2,147	1,567	3,572	2,124
9913	3,359	5,331	3,458	5,559	4,632	9,314
9914	6,191	2,591	8,057	2,756	10,506	3,399
9915	5,476	2,056	7,316	3,299	8,408	4,392
9916	4,022	1,950	5,352	2,113	5,738	2,475
Total	1,532,072	2,109,745	1,827,280	2,393,707	2,146,784	2,946,913

Appendix B: PSRC FAZ Boundaries



Appendix C: Scenario Vicinity Maps

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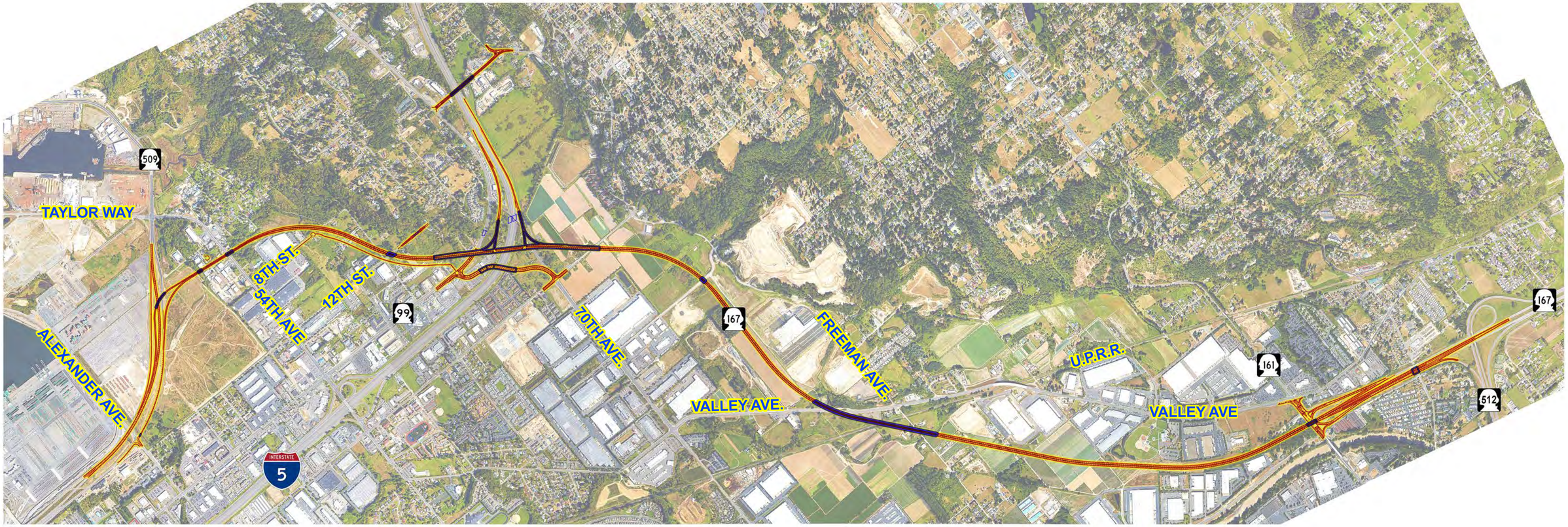
SR 167 COMPLETION PROJECT

SCENARIO 1: Closing the Gap



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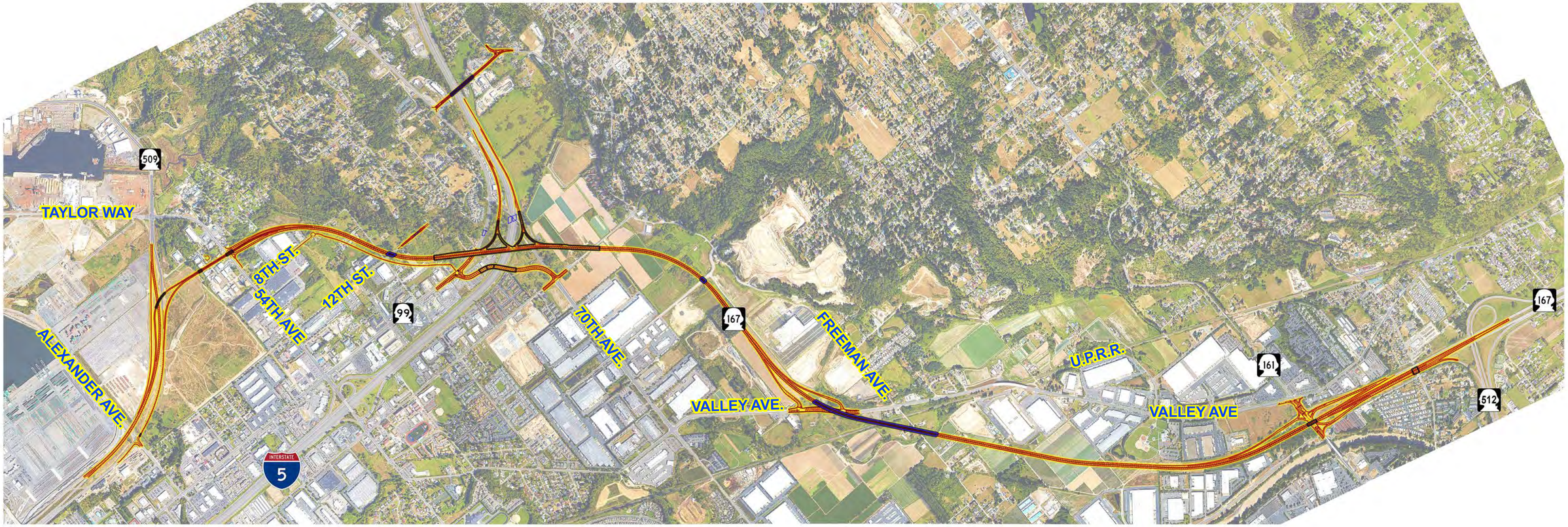
SR 167 COMPLETION PROJECT

SCENARIO 2: Limited Connectivity



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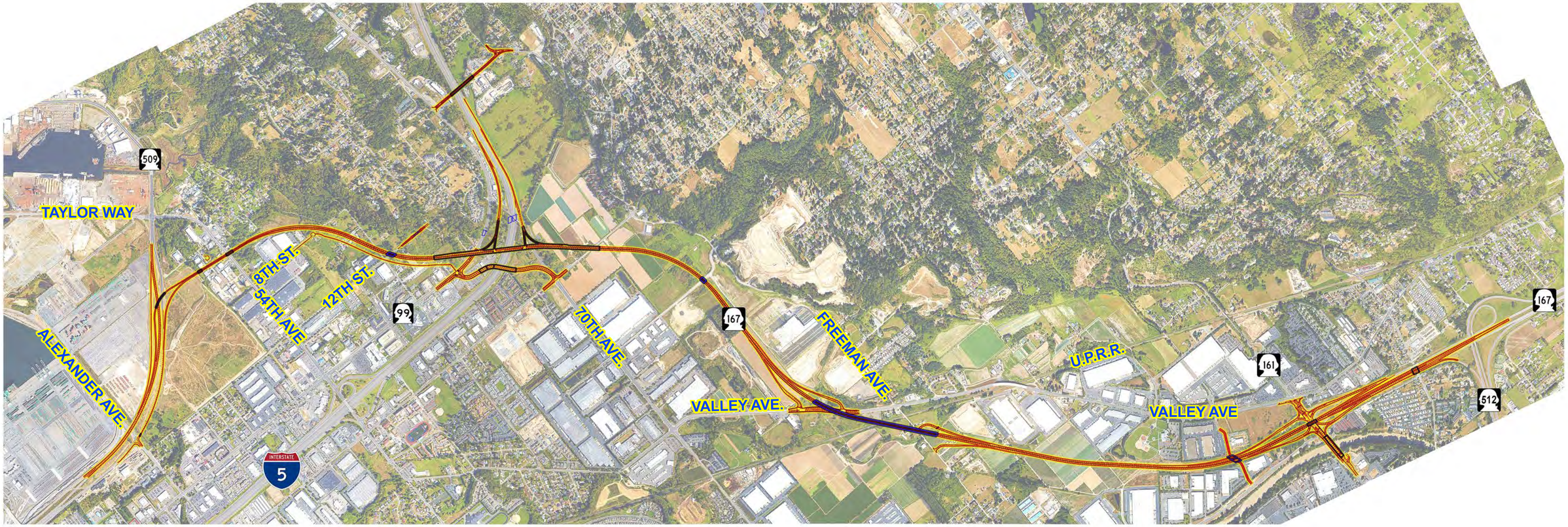
SR 167 COMPLETION PROJECT

SCENARIO 3: Gateway Connectivity



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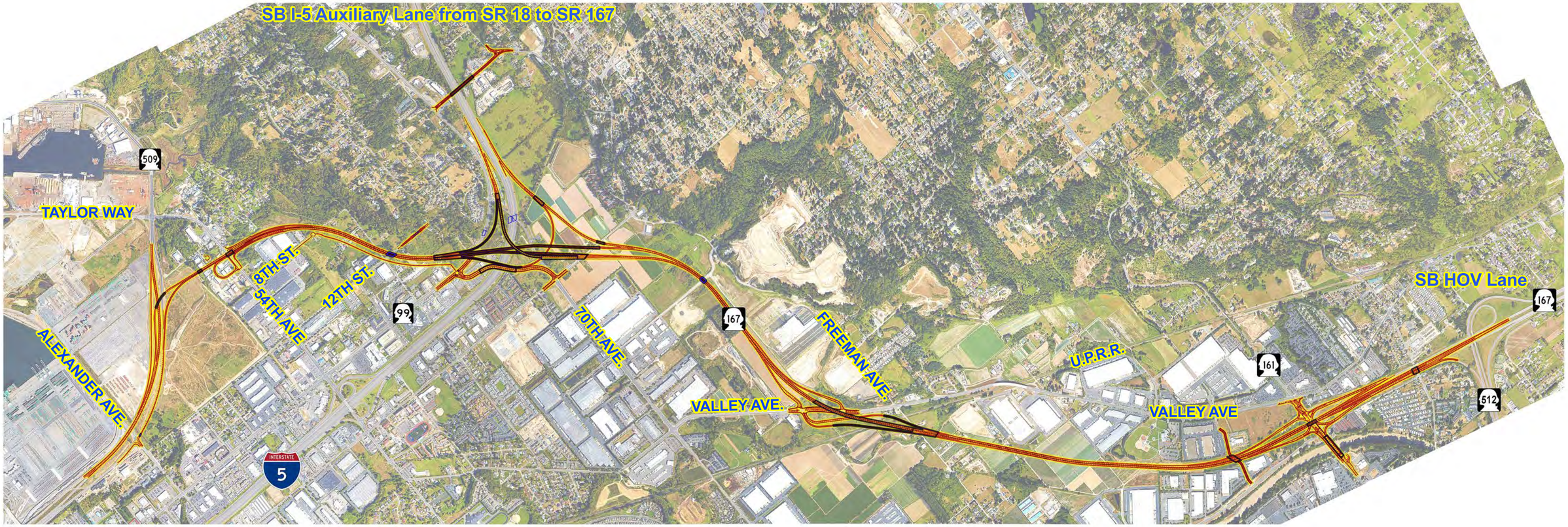
SR 167 COMPLETION PROJECT

SCENARIO 4: Moderate Connectivity



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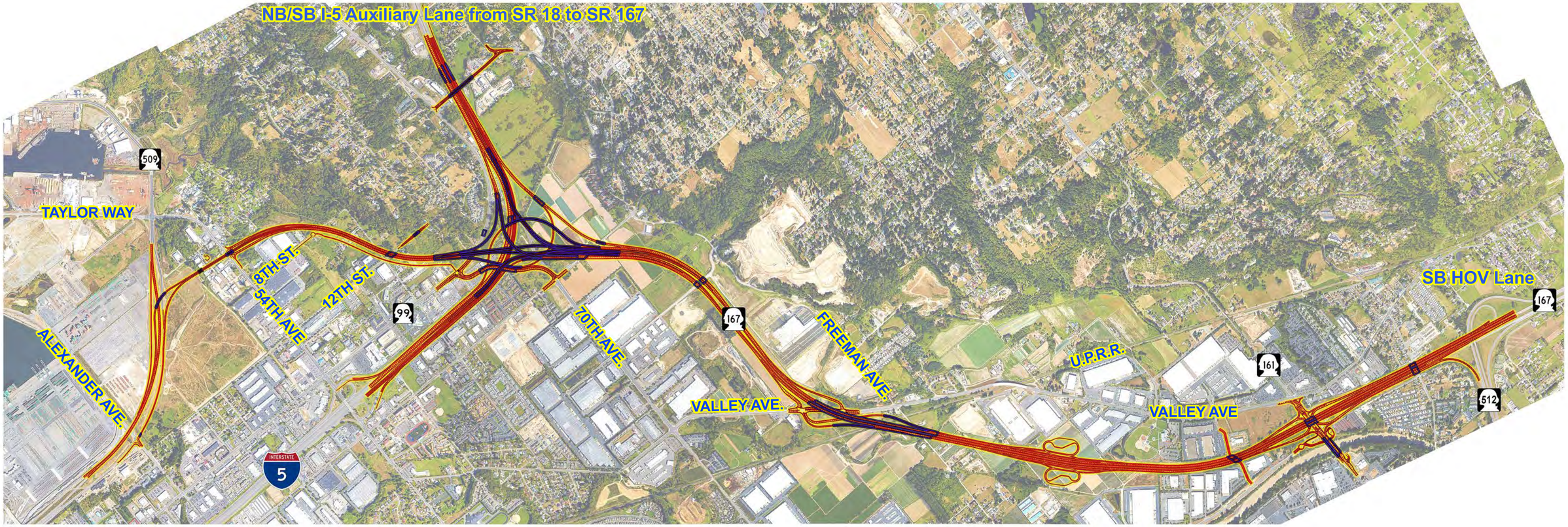
SCENARIO 5: Full Build Out +



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Washington State Department of Transportation

PUGET SOUND GATEWAY

Attachment D: Land Use Reallocation for Gateway Program Travel Modeling Technical Memorandum

MEMORANDUM

Date: August 5, 2016

To: PB and PSRC Staff

From: Bob Sicko and Chris Breiland, Fehr & Peers

Subject: Land Use Reallocation for Gateway Program Travel Modeling

SE16-0442

This memorandum describes the assumptions used by Fehr & Peers to develop adjusted 2015 and 2025 FAZ-level household and employment land use forecasts and create a 2045 land use forecast for use in the WSDOT Gateway Program analysis. The methodology to develop these adjusted forecasts—based on the PSRC Land Use Vision (LUV.1) forecast—was generally discussed at a meeting with PSRC staff on July 6, 2016. The results of the adjustment are summarized at the end of this memo.

Overall Approach

Our approach to updating the FAZ level forecasts is summarized below:

1. Compare and assess 2014 and 2015 estimates
2. Update 2025 estimates based on the adjusted 2015 FAZ-level estimates
3. Update 2040 estimates based on the adjusted 2025 FAZ-level estimates
4. Create 2045 estimates based on the adjusted 2040 FAZ-level estimates
5. Review and update distribution of 2025 and 2045 employment sector forecasts

The employment data contains several sectors. The regional travel model does not use the construction and resources sector and it is not considered in this analysis. A brief description of the general approach used in the process to develop the adjusted forecasts for each step is described below.

Compare and Assess 2014 and 2015 Estimates

The initial comparison was performed using a 2014 FAZ-level land use estimate developed and provided by the PSRC and a 2015 land use estimate developed by BERK Consulting (tract-level) and Fehr & Peers (FAZ-level) for the SR 99 Investment-Grade Traffic and Revenue study. The 2015 estimates were developed in close coordination with the PSRC and generally have a high degree of detail and validation across the region. The household data for 2015 was developed in a similar manner to the 2014 estimates by adding building permit data to US Census Bureau household information. The 2014 employment estimates were developed using the latest data from the Quarterly Census of Employment and Wages. This data is point specific and can be aggregated into any geometry. The 2015 estimates were developed by building off the official historical employment datasets prepared by the PSRC. The 2015 employment estimates include covered employment counted in the

Quarterly Census of Employment and Wages as well as several categories of non-covered employment including unincorporated self-employed individuals.

Households

The 2014 and 2015 total household estimates were compared to determine if any significant illogical differences could be found. The 2014 estimates for households were used as the base for the comparison. That is, it was assumed that there should be no negative growth between 2014 and 2015. Generally, if notable negative growth was discovered, the 2015 estimate was made equal to the 2014 estimate. Growth rates were also compared, but there were no illogically high growth rates between 2014 and 2015.

Employment

The 2014 and 2015 total employment estimates were similarly compared. A review of the differences between 2014 and 2015 showed that most of the FAZ-level differences were between -1,000 and 1,000 jobs. If the 2015 FAZ-level estimate was lower, but by less than -1,000, the FAZ employment total was set to equal the 2014 total. If the FAZ-level employment difference was outside of the range, (positive or negative) the characteristics of the FAZ were examined to determine if a there was a logical rationale for the difference (e.g., rapid growth in South Lake Union employment is reasonable). In general, it was found that most of the FAZ differences were due to a higher 2015 employment estimate. To rectify the differences, the average of the employment totals for 2014 and 2015 were used, which generally resulted in a net growth in employment between the two years.

Update 2025 estimates based on the adjusted 2015 FAZ-level estimates

The estimate of 2025 FAZ-level land use performed in a similar manner as Task 1 by comparing the updated 2025 household and employment totals against the 2015 totals. There were very few FAZs with negative household growth. In those cases, the 2025 household estimate was set equal to 2015.

The adjustments to employment were made in two phases. The first was to determine if a significant decrease in 2025 employment was found. In general, large decreases in employment in one FAZ were associated with large increases in employment in the neighboring FAZ. In these cases, a visual inspection of the land uses in the FAZ were made and we generally transferred the growth from the adjacent FAZ to eliminate the loss of employment.

Update 2040 estimates based on the adjusted 2025 FAZ-level estimates

There were very few instances of negative growth between 2025 and 2040. All negative growth in either households or employment were converted to be at least equal to the 2025 total. The same sectoral adjustments described for 2025 were performed for 2040.

Create 2045 estimates based on the final 2040 FAZ-level estimates

Development of the 2045 involved working with PSRC staff to determine how factor household/employment forecasts from 2040 to 2045. The following outlines the approach that was agreed upon:

- Determine the annual average growth between 2025 and 2040.
- Determine the annual average growth between 2035 and 2040.
- Average the annual average growth and apply to the adjusted 2040 FAZ-level estimates.

Review & Update Distribution of 2025 and 2045 Employment Sector Forecasts

This task involved the review of FAZs that compose the Regional Growth Centers and Manufacturing/Industrial Centers throughout the region, but with a particular focus in the centers adjacent to the Gateway Program study area. The review included evaluation of the following:

- Employment within a sector from 2014, 2015, 2025, 2040, and 2045 for each Center
- A sector's share of total employment from 2014, 2015, 2025, 2040, and 2045 for each Center

Review of the FAZ-level employment sectorial distributions showed that many of the FAZs had irregular sector-level employment changes from 2014 to 2015 to 2025 to 2040. The sector distributions we modified to reflect the 2015 distributions. The 2045 land use was updated to reflect the same sector distribution that was found in the 2040 LUV 1.0 forecasts. The 2040 distribution was used to better reflect a more logical growth in the Wholesale, Transportation, Utility and Manufacturing sector. Table 1 and Table 2 provide a summary of the original and adjusted sector distributions for key markets in the Gateway Program study area.

Table 1
Distribution of Employment by Sector for Select PSRC FAZs in the Puget Sound Gateway Program Study Area—Original

			Employment (w/o Construction-Resource)			Manufacturing			Retail - Food Services			Other Employment Sectors[c]		
Regional Growth Centers (RGC) / Manufacturing Industrial Centers (MIC)	FAZ10	Location / Nearest City	2014[a]	2025[b]	2040[b]	2014[a]	2025[b]	2040[b]	2014[a]	2025[b]	2040[b]	2014[a]	2025[b]	2040[b]
Sumner Pacific - MIC	900	Sumner area	12,152	13,649	15,523	7,672	5,867	6,470	2,339	2,603	3,177	2,141	5,179	5,876
						63%	*43%*	*42%*	*19%*	*19%*	*20%*	*18%*	*38%*	*38%*
Puyallup Downtown - RGC	1116	Puyallup CBD	6,411	8,116	13,464	191	349	601	2,624	2,919	4,482	3,596	4,848	8,381
						3%	*4%*	*4%*	*41%*	*36%*	*33%*	*56%*	*60%*	*62%*
Puyallup South Hill - RGC	1120	Wildwood / Shaw Road	11,893	13,257	16,465	686	680	840	2,721	3,106	4,235	8,486	9,471	11,390
						6%	*5%*	*5%*	*23%*	*23%*	*26%*	*71%*	*71%*	*69%*
Tacoma Mall - RGC	1420	Tacoma Mall / South Tacoma	11,618	16,114	31,252	1,042	1,349	2,413	5,625	7,288	12,445	4,951	7,477	16,394
						9%	*8%*	*8%*	*48%*	*45%*	*40%*	*43%*	*46%*	*52%*
Tacoma Downtown - RGC	1810	Tacoma CBD / Union Station	12,148	15,120	21,762	468	1,313	1,698	998	1,779	2,753	10,682	12,028	17,311
Tacoma Downtown - RGC	1820	Tacoma CBD / Stadium	19,081	23,467	30,283	215	1,130	1,215	930	916	1,404	17,936	21,421	27,664
Sub Total			*31,229*	*38,587*	*52,045*	*683*	*2,443*	*2,913*	*1,928*	*2,695*	*4,157*	*28,618*	*33,449*	*44,975*
						2%	*6%*	*6%*	*6%*	*7%*	*8%*	*92%*	*87%*	*86%*
Port of Tacoma - MIC	1900	Port Of Tacoma	10,958	11,146	16,878	7,685	7,009	9,307	559	972	1,723	2,714	3,165	5,848
Port of Tacoma - MIC	2000	Fife area	12,172	14,453	17,181	5,470	6,325	7,593	2,350	2,338	2,841	4,352	5,790	6,747
Sub Total			*23,130*	*25,599*	*34,059*	*13,155*	*13,334*	*16,900*	*2,909*	*3,310*	*4,564*	*7,066*	*8,955*	*12,595*
						57%	*52%*	*50%*	*13%*	*13%*	*13%*	*31%*	*35%*	*37%*
Federal Way - RGC	3020	Central Federal Way	*	23,434	30,132	1,253	1,232	1,399	5,266	6,584	7,833	*	15,618	20,900
						*	*5%*	*5%*	*	*28%*	*26%*	*	*67%*	*69%*
Auburn - RGC	3130	Auburn North	18,923	23,779	31,330	7,352	7,055	8,470	3,538	5,370	7,264	8,033	11,354	15,596
						39%	*30%*	*27%*	*19%*	*23%*	*23%*	*42%*	*48%*	*50%*
Kent - RGC	3505	Kent CBD / Kent East Hill	14,968	19,257	25,150	2,619	2,624	2,983	3,661	4,959	6,300	8,688	11,674	15,867
						17%	*14%*	*12%*	*24%*	*26%*	*25%*	*58%*	*61%*	*63%*
Kent - MIC	3600	Kent Industrial	42,552	54,472	64,500	28,454	36,974	37,182	4,150	5,796	8,895	9,948	11,702	18,423
						67%	*68%*	*58%*	*10%*	*11%*	*14%*	*23%*	*21%*	*29%*
SeaTac - RGC	3705	Sea-Tac area	30,331	46,249	72,497	14,998	19,146	28,978	4,327	5,652	8,619	11,006	21,451	34,900
						49%	*41%*	*40%*	*14%*	*12%*	*12%*	*36%*	*46%*	*48%*
Tukwila - RGC	3900	South Tukwila	20,602	21,217	25,382	4,084	3,804	3,614	8,871	7,416	9,764	7,647	9,997	12,004
						20%	*18%*	*14%*	*43%*	*35%*	*38%*	*37%*	*47%*	*47%*
4-County Regional Total			*	2,271,914	2,845,306	*	393,840	429,021	*	405,754	538,822	*	1,472,320	1,877,463
						*	*17%*	*15%*	*	*18%*	*19%*	*	*65%*	*66%*

Notes:
[a] Year 2014 employment was developed by PSRC (December 2015)
[b] Year 2025 and 2040 employment is from PSRC's Land Use Vision (LUV.1) forecasts (January 2016)
[c] Other employment sectors included are FIRE (Finance, Insurance and Real Estate), Government, and Education. Construction-Resource employment is excluded from the numbers shown in this table.
Kent MIC's retail employment for the year 2014 was estimated by interpolating between PSRC's LUV.1 (January 2016) 2010 and 2025 employment.

Table 2
Distribution of Employment by Sector for Select PSRC FAZs in the Puget Sound Gateway Program Study Area—Adjusted

Table 2
Distribution of Employment by Sector for Select PSRC FAZs in the Puget Sound Gateway Program Study Area - Ajusted

			Employment (w/o Construction-Resource)			*WTU & Manufacturing*			*Retail - Food Services*			*Other Employment Sectors[c]*		
Regional Growth Centers (RGC) / Manufacturing Industrial Centers	*FAZ10*	*Location / Nearest City*	*2015[a]*	*2025[a]*	*2045[a]*	*2015[a]*	*2025[a]*	*2045[a]*	*2015[a]*	*2025[a]*	*2045[a]*	*2015[a]*	*2025[a]*	*2045[a]*
Sumner Pacific - MIC	900	Sumner area	12,626	13,649	16,622	8,733	9,441	10,000	1,689	1,826	2,503	2,204	2,382	4,119
						69%	*69%*	*60%*	*13%*	*13%*	*15%*	*17%*	*17%*	*25%*
Puyallup Downtown - RGC	1116	Puyallup CBD	6,623	8,116	16,368	292	358	731	2,724	3,338	5,449	3,607	4,420	10,188
						4%	*4%*	*4%*	*41%*	*41%*	*33%*	*54%*	*54%*	*62%*
Puyallup South Hill - RGC	1120	Wildwood / Shaw Road	12,053	13,257	17,581	531	584	897	2,597	2,856	4,522	8,925	9,816	12,162
						4%	*4%*	*5%*	*22%*	*22%*	*26%*	*74%*	*74%*	*69%*
Tacoma Mall - RGC	1420	Tacoma Mall / South Tacoma	12,520	16,114	37,130	1,021	1,314	1,450	6,592	8,484	19,549	4,907	6,316	14,553
						8%	*8%*	*4%*	*53%*	*53%*	*53%*	*39%*	*39%*	*39%*
Tacoma Downtown - RGC	1810	Tacoma CBD / Union Station	12,789	15,120	23,790	362	428	674	934	1,104	2,172	11,493	13,587	20,945
Tacoma Downtown - RGC	1820	Tacoma CBD / Stadium	19,421	23,467	31,966	786	950	1,078	981	1,185	1,492	17,654	21,332	29,396
Sub Total			*32,210*	*38,587*	*55,757*	*1,148*	*1,378*	*1,752*	*1,915*	*2,290*	*3,664*	*29,147*	*34,920*	*50,341*
						4%	*4%*	*3%*	*6%*	*6%*	*7%*	*90%*	*90%*	*90%*
Port of Tacoma - MIC	1900	Port Of Tacoma	10,722	11,146	18,607	6,958	7,233	10,261	574	597	1,899	3,190	3,316	6,447
Port of Tacoma - MIC	2000	Fife area	12,941	14,453	18,018	6,645	7,421	7,963	2,367	2,644	2,979	3,929	4,388	7,076
Sub Total			*23,663*	*25,599*	*36,625*	*13,603*	*14,655*	*18,224*	*2,941*	*3,241*	*4,878*	*7,119*	*7,704*	*13,523*
						57%	*57%*	*50%*	*12%*	*13%*	*13%*	*30%*	*30%*	*37%*
Federal Way - RGC	3020	Central Federal Way	18,827	23,434	32,425	1,526	1,900	2,009	5,360	6,672	8,292	11,940	14,862	22,124
						8%	*8%*	*6%*	*28%*	*28%*	*26%*	*63%*	*63%*	*68%*
Auburn - RGC	3130	Auburn North	19,747	23,779	34,023	7,375	8,880	9,198	3,794	4,569	7,888	8,578	10,330	16,937
						37%	*37%*	*27%*	*19%*	*19%*	*23%*	*43%*	*43%*	*50%*
Kent - RGC	3505	Kent CBD / Kent East Hill	15,560	19,257	27,863	2,724	3,371	3,503	4,011	4,964	6,923	8,825	10,922	17,437
						18%	*18%*	*13%*	*26%*	*26%*	*25%*	*57%*	*57%*	*63%*
Kent - MIC	3600	Kent Industrial	44,671	54,472	67,785	29,150	35,545	39,076	3,582	4,368	8,348	11,939	14,559	20,361
						65%	*65%*	*58%*	*8%*	*8%*	*12%*	*27%*	*27%*	*30%*
SeaTac - RGC	3705	Sea-Tac area	31,251	46,249	81,538	13,830	20,468	32,592	4,446	6,579	9,694	12,975	19,203	39,252
						44%	*44%*	*40%*	*14%*	*14%*	*12%*	*42%*	*42%*	*48%*
Tukwila - RGC	3900	South Tukwila	20,213	21,217	26,511	3,279	3,442	3,775	6,360	6,676	9,198	10,574	11,099	13,538
						16%	*16%*	*14%*	*31%*	*31%*	*31%*	*52%*	*52%*	*51%*
4-County Regional Total			1,972,243	2,284,776	3,072,295	353,032	403,887	460,480	371,255	433,157	582,921	1,247,956	1,447,732	2,028,894
						18%	*18%*	*15%*	*19%*	*19%*	*19%*	*63%*	*63%*	*66%*

Notes:

[a] Land Use Adjusted from LUV.1 to remove decreasing households, employment, and unusual employment sector changes.

[c] Other employment sectors included are FIRE (Finance, Insurance and Real Estate), Government, and Education. Construction-Resource employment is excluded from the numbers shown in this table.

Attachment E: Future (2045) Transportation Projects

Gateway Program DTA--Funded Projects to be Included in future baseline network

Facility	Project	Description	Lead Agency	Model Year
I-5	Tacoma HOV Improvements	Extend HOV lanes to SR 16	WSDOT	2025
I-5	JBLM Corridor Improvements	Additional lanes & rebuilt interchanges through JBLM	WSDOT	2025
I-5	Federal Way Triangle Vicinity Improvements	New ramps and capacity improvements at SR 18 and S 356th St	WSDOT	2045
I-90	Eastside Restripe Shoulders	Peak period hard shoulder running from Eastgate to Issaquah	WSDOT	2025
SR 99	Alaskan Way Viaduct Replacement	SR 99 tunnel and rebuilt Alaskan Way	WSDOT	2025
SR 161	36th to Vicinity 24th St E - Widen to 5 Lanes	Additional lane in each direction	WSDOT	2045
SR 167	8th St E Vicinity to S 277th St Vicinity - Southbound Mana	Add southbound HOT lane from 277th to 8th	WSDOT	2025
I-405	SR 167 Interchange Direct Access Connector	Add north-north and south-south direct access ramps	WSDOT	2045
I-405	Renton to Lynnwood Corridor Widening	Widen I-405 and add ETLs from Bellevue to Lynnwood	WSDOT	2025
I-405	Renton to Lynnwood Corridor Widening	Widen I-405 and add ETLs from Bellevue to Renton	WSDOT	2025
I-405	NB Hard Shoulder Running -- SR 527 to I-5	Add PM peak period hard should running from SR 527 to I-5	WSDOT	2025
SR 518	Des Moines Interchange Improvement Project	Add EB offramp from SR 518 to Des Moines Memorial Dr	WSDOT	2025
SR 520	Bridge Replacement and HOV	Provide HOV lane in each direction across Lake Washington, incl. Wes	WSDOT	2025
SR 520	Seattle Corridor Improvements	Rebuild and widen from I-5 to Floating Bridge, incl. DA ramps at Mont	WSDOT	2045
SR 520	124th St Interchange	Provide ramps to and from the east at 124th Ave NE	WSDOT	2025
SR 18	Eastbound Off-Ramp	Improve offramp to SR 164	WSDOT	2025
I-90	SR 18 Interchange Improvements	Build WB to SB flyover ramp	WSDOT	2045
S 228th St	Union Pacific Grade Separation	Bridge over UP tracks	Kent	2025
28th/24th Ave S	Connecting 28th/24th Ave S (SeaTac); Transportation Gat	Completes 4-lane arterial from 28th Ave S in SeaTac to 24th Ave S in D	SeaTac, Des Moines	2025
I-5	Port of Tacoma Road Interchange	Add new bridge at 34th Ave E, reconfigure ramps	Fife	2025
I-5	54th Ave E Interchange (Partial only)	Move SB onramp to Pacific Highway/51st Ave E, add second SB exit	Fife	2045
SR 99	Pacific Highway HOV Lanes Phase V	Add HOV lanes in each direction from S 340th S to S 359th St	Federal Way	2025
72nd Ave S	72nd Avenue South Extension	Completes arterial between S 196th St and S 200th S	Federal Way	2025
S 224th St	S 224th Street Project	New arterial with bridge over SR 167, connecting with 88th Ave S	Kent	2025
Shaw Rd E	23rd to Manorwood Drive Project	Add TWLTL from 23rd Ave to Manorwood Dr	Puyallup	2025
39th Ave SW	39th Ave SW Widening	Widen 39th Ave SW from 11th St to 17th St	Puyallup	2025
S 200th St	Military Road South/I-5 Ramp Intersection Improvements	Upgraded channelization and signal at S 200th St/Military Rd S/I-5 rar	Sound Transit	2025
S 216th St	Transportation Gateway Project	Widen to 5-lane section between 24th Ave S and SR 99	Des Moines	2025
S 277th St	S 277th St Corridor Capacity Improvements	Add additional lanes between Auburn Way and L St NE	Auburn	2025
W Main St	Multimodal Corridor and ITS Improvements	Road diet to W Main from W Valley Highway to Interurban Trail	Auburn	2025
S 212th St	72nd Avenue South Intersection Improvement	Add additional SBL turn lane	Auburn	2025
I Street NE	45th St NE to S 277th St	Complete 5-lane arterial	Auburn	2025
Bypass Rd	R Street Bypass	Builds to arterial connecting M St SE with Auburn Black Diamond Rd	Auburn	2025
Stander Blvd	Stander Blvd Extension Phase II	Completes Strander Blvd/27th Street under RR	Tukwila	2025
SR 167	NB/SR 410 to SR 18	add NB & SB HOV/HOT lane	WSDOT	2025
Airport South Access Interim	S 188th St into Airport	Arterial connection to SeaTac Airport	Port of Seattle	2025
Airport South Access Expressway	SR 509 at 24th/28th into Airport	Expressway connection to SeaTac Airport	Port of Seattle	2045

Attachment F: Dynameq Gateway DTA Model Network Map



Attachment G: Dynameq Model Validation Technical Memorandum

PUGET SOUND GATEWAY PROGRAM

DTA Model Documentation and Validation

Technical Memorandum

June 2017

Prepared for:

Washington State Department of Transportation

Prepared by:

WSP

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Overview

This technical memorandum summarizes and documents the key assumptions and validation process related to the development of a dynamic traffic assignment (DTA) model for the Puget Sound Gateway Program. As part of the SR 167 and SR 509 Completion Projects for the Gateway Program, a DTA model based on Dynameq (INRO) software was established to assess current and future traffic flow conditions for the I-5 corridor, SR 167 and SR 509 extensions (tolled and untolled), freeway ramp facilities, and nearby arterial intersections. This mesoscopic modeling platform was deemed suitable for the purposes of investigating corridor-level performance, route and pathway diversion, and the effects of segment-based facility tolling due to its blending of traffic assignment capabilities with the intersection/link operational analysis characteristics of traffic simulation tools thereby bridging the "gap" between the more commonly used macroscopic and microscopic paradigms.

The goal of the DTA model documentation was to describe the key assumptions associated with model development in terms of the demand inputs and parameters. For the validation process, the primary objective was to compare the outputs and results from the initially developed base year (existing conditions) DTA model to observed data sources and adjust the model inputs in order to strengthen the correlation between model-based and observed data. Several measures were used to validate the DTA model, including freeway segment, ramp, and arterial volumes as well as route travel times. The outcomes of the model validation, as summarized in the following sections, demonstrate that the Gateway DTA model is able to replicate observed freeway performance and ramp demands reasonably well when model inputs are refined and select link attribute adjustments are incorporated.

Purpose and Need

The primary purpose of documenting and validating the DTA model was to highlight key assumptions related to the model inputs and demonstrate reasonable replication of existing corridor performance (volumes and travel times) through a series of model calibration adjustments. As with most DTA modeling efforts, initial development of the Gateway DTA model produced corridor performance results that were not meaningful in terms of model run convergence and thus required network element refinements to compare to existing observed data. The need for such calibration stems from the desire to establish a credible and reliable traffic modeling platform for testing of future corridor facility elements, namely the SR 167 and SR 509 extensions and related improvements along I-5. Calibration and validation of traffic modeling tools, along with the documentation of model assumptions, is a standard industry requirement for both project-based and programmatic-level transportation analysis.

Study Area

The project study area and DTA model network, shown in Figure 1 and Figure 2, includes the core limited-access freeway facilities, ramp meters, and major interchange areas between Tacoma and Tukwila, including I-5 from I-705 in Tacoma to north of I-405 in Tukwila, SR 167 from I-405 to Puyallup, and SR 18 from I-5 to east of SR 167. Also included in the network and study area are major arterials, such as SR 99/Pacific Highway South, River Road (SR 167), Meridian Avenue (SR 161) and SR 516/Kent Des Moines Road as well as a number of collector and local arterials. The network elements and link density reflected in the study area were explicitly targeted and incorporated in order to ensure that a realistic number of travel paths and routing alternatives were represented for the origin-designation pairs examined.

Figure 1. Gateway Program Analysis Study Area Boundary

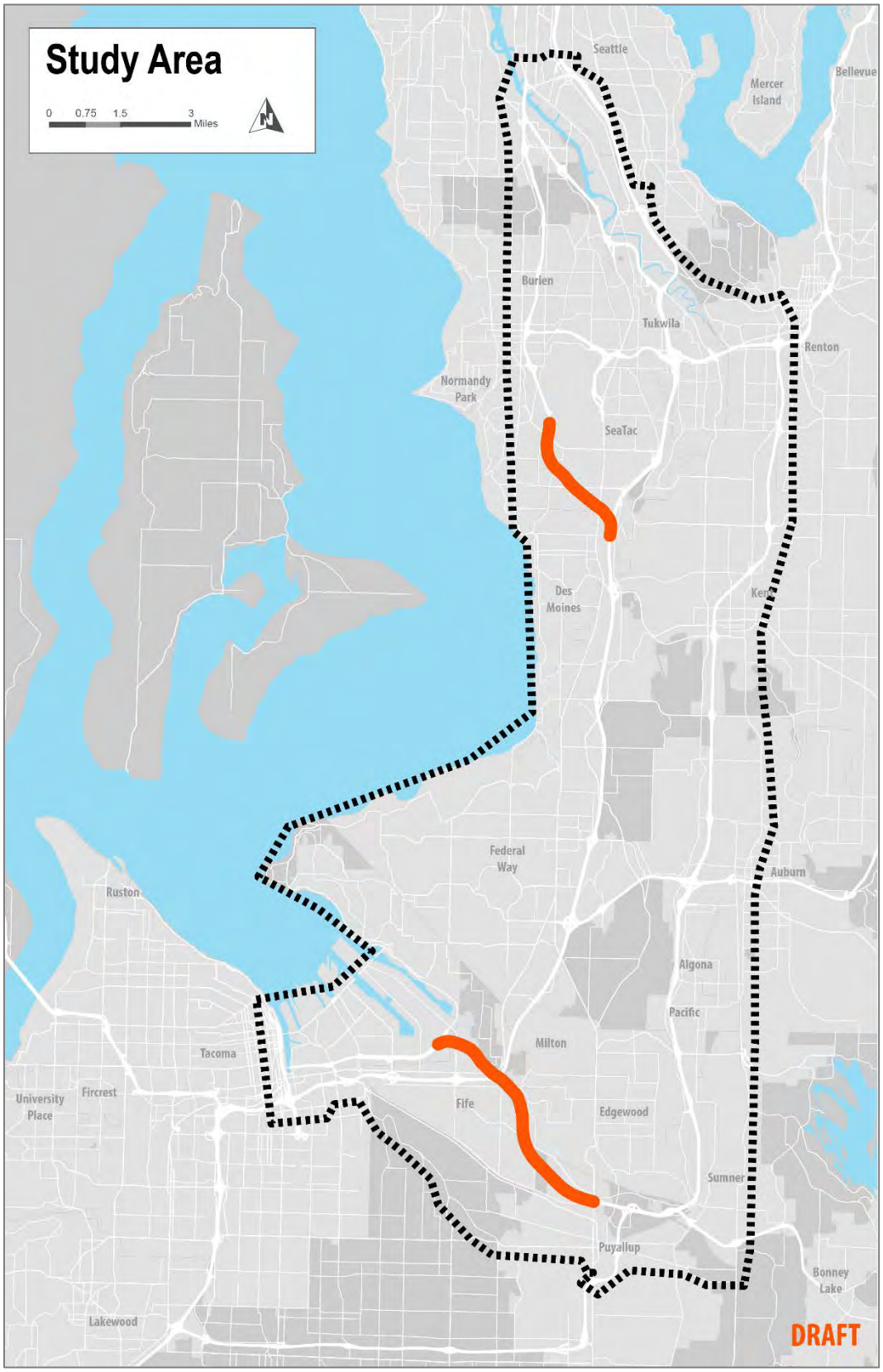
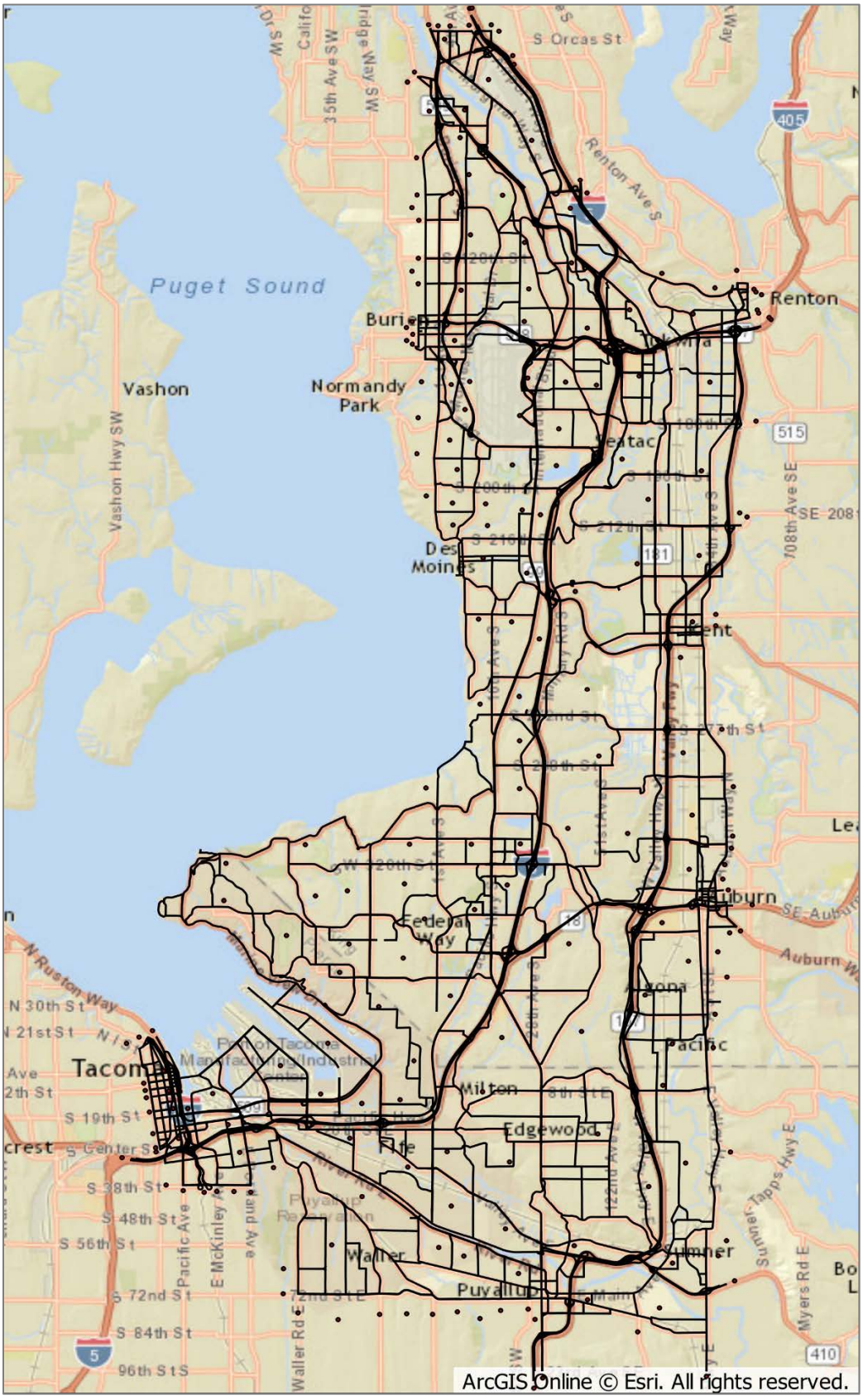


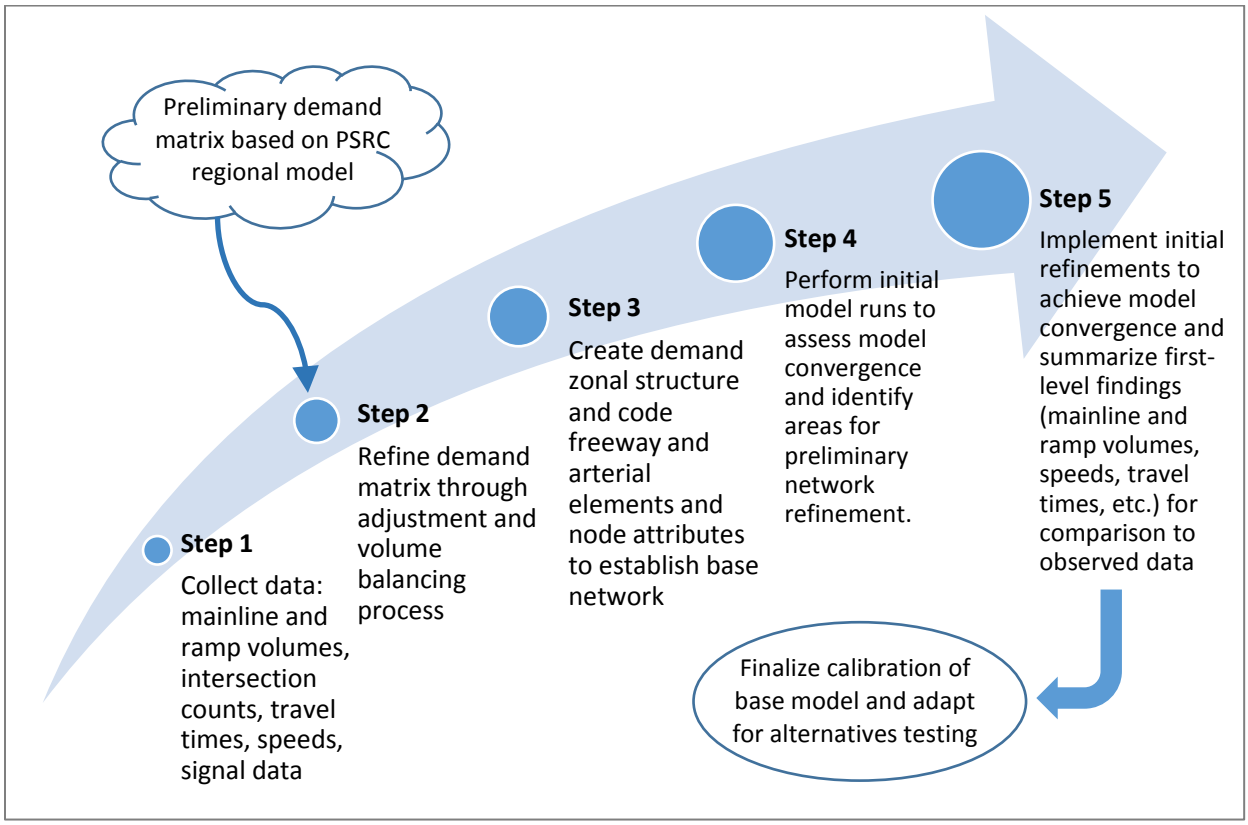
Figure 2. Gateway DTA Model Network



Methodology

The methodology used to develop the Gateway DTA model was based on a similar approach employed for the preliminary SR 99 DTA toll modeling work (WSDOT 2015), which involved the key steps highlighted in Figure 3.

Figure 3. DTA Model Development Process



The outcomes of the comparison between model-based results and observed data (Step 5) helped to guide the calibration process and identify where follow-on model adjustments would be targeted. To calibrate the model, several network elements were adjusted in iterative fashion to improve the correlation between model-based and observed corridor performance. These adjustments, listed below, were prioritized based on a facility-based hierarchy.

Calibration Adjustments

- Freeways – driver response times, link speeds
- Arterials – driver response times, link speeds
- Intersections – signal timing revisions (phase durations, cycle lengths, coordination)
- Vehicle composition (distribution of speeds ratios, effective lengths, and response times within each vehicle class)

Driver response time and link speed adjustments were both used, either independently or in combination, to increase or reduce link capacities by varying car following behavior, potential traffic density, and desired speeds. By adjusting the effective link capacities in this manner, resulting traffic

demand assignments to the subject freeway or arterial segment would better match observed volume data. The traffic composition adjustments for freeways and arterials primarily involved the break out of vehicle classes into finer-level speed profiles to account for greater variations in speed and thus more realistic friction levels and driver interactions for each targeted segment.

Key Assumptions

Development of the base year DTA model involved a number of inputs and parameters related to vehicle demand components and distribution of trips. Assumptions regarding these inputs are described in the sections below.

Travel Demand Input

Development of the travel demand input (i.e., zone-to-zone vehicle trips by vehicle class) to the DTA model involved two steps. In the first step, the Puget Sound Regional Council (PSRC) travel demand model, tailored to suit the Puget Sound Gateway Program, was used to produce initial base year vehicle trip matrices. Subsequently, actual traffic counts data within the study area were used to perform matrix estimation to refine travel patterns of trips within and to/from the study area.

Vehicle Classification

While the PSRC model maintains 11 vehicle classes, the vehicle trip tables prepared for the DTA model uses 6 vehicle types. This was accomplished by aggregating all four home-based work (HBW) trips and the home-based other (HBO) trips into all-purpose single-occupant vehicle (SOV) vehicle trips; vanpool trips were also combined into three or more occupant-vehicle (3+HOV) trips as one class. The resulting travel demand matrices used in the DTA model are defined as follows:

- Single-occupant vehicles (SOV)
- Two-occupant vehicles (2-HOV)
- Three or more-occupant vehicles (3+HOV)
- Light trucks
- Medium trucks
- Heavy trucks

Table 1 includes corresponding total vehicle trips input to the DTA model for the AM/PM peak periods.

Table 1. Base Year (2016) AM/PM Peak Period Vehicle Trips used in the DTA Model

	AM Period	PM Period
Single-occupant vehicles (SOV)	428,130	553,260
Two-occupant vehicles (2-HOV)	116,460	132,240
Three or more-occupant vehicles (3+HOV)	46,960	52,250
Light trucks	57,330	66,650
Medium trucks	13,610	12,210
Heavy trucks	13,710	11,140

Truck Data

GPS-based origin-destination survey data were used to develop medium and heavy truck trip matrices used in the DTA model. American Transportation Research Institute (ATRI) has assembled GPS-based truck trip origin-destination data for a number of metropolitan areas. ATRI also assisted in assembling such truck data for the Puget Sound region as well as for Washington State. The 8 weeks of data (four 2-week weekday time periods) were selected from ATRI's truck GPS database. The shapefiles for the zonal

system and roadway segments as well as the actual truck counts data were provided to ATRI. The raw GPS-based truck data were expanded by ATRI and resulting assignment results were subsequently checked for reasonableness. Table 2 shows a summary of unexpanded and expanded truck data by time of day.

Table 2. ATRI Unexpanded and Expanded Truck OD Data (2016) for the Puget Sound Region

Time of Day Period	Unexpanded	% of Daily	Expanded	% of Daily	Expansion Factor
AM peak	1,059	17%	14,595	18%	13.8
Mid-day	2,363	38%	31,360	39%	13.3
PM peak	717	12%	8,800	11%	12.3
Evening	642	10%	8,107	10%	12.6
Night	1,367	22%	17,712	22%	13.0
Average weekday	6,147	100%	80,574	100%	13.1

The ATRI data was used with limited adjustment in developing the heavy truck matrices for the model. However, as the dataset was approximately 80% heavy trucks and 20% medium trucks, 20% of the observed truck travel was blended into the medium truck matrix.

Value of Travel Time

The value of travel time (VOT) used in the DTA model for future years was derived from those used by Stantec in 2015 to perform Level I traffic and revenue forecasting analysis for the SR 509 extension project. The original VOTs were expressed in 2013 dollars and for all 11 vehicle classes used in the PSRC model. These 11 values of time were weighted by the number of vehicles in each class in the demand model to develop the six VOTs shown in Table 3.

Table 3. Value of Travel Time (VOT) Aggregated to Vehicle Classes Used in the DTA Models

Vehicle Class	VOT ($/hour) in 2015 $s	VOT ($/second) in 2015 $s
Single-occupant vehicles (SOV)	20.60	0.005722
Two-occupant vehicles (2-HOV)	25.05	0.006958
Three or more-occupant vehicles (3+HOV)	25.05	0.006958
Light trucks	22.25	0.006181
Medium trucks	57.35	0.015931
Heavy trucks	57.35	0.015931

Source: Stantec Memo (May 6, 2015), Ref: SR 509 Level I Traffic and Revenue Forecasts

SeaTac Airport Trips

Trips to/from SeaTac Airport were developed using the updated trip distribution component of the PSRC travel demand model, as original airport-bound trips exhibited shorter average trip length. This was rectified in the PSRC model version used for the Puget Sound Gateway project. The resulting origin-destination trips to/from SeaTac Airport were scaled to reflect actual traffic counts to and from the airport expressway.

Data Collected

For the DTA model calibration, a significant amount of data was needed for comparison purposes in order to identify where model refinements would be targeted. Data was categorized into four main groupings – volumes, speeds, travel times, and intersection control (signals).

Volumes

I-5 and SR 167 volume data was obtained from the Washington State Department of Transportation (WSDOT) and included hourly counts divided into in 15-minute increments. Where available, hourly ramp volume data in 15-minute increments was also obtained for these facilities. Intersection turning movement counts for peak hours or peak periods were provided by local municipalities (City of Puyallup, City of Tacoma, City of Fife, etc.) or were manually collected using a data collection vendor.

Speeds

Speed data for selected I-5 and SR 167 point locations was also provided by WSDOT. While model calibration to speed data was not explicitly performed, spot speed data was used for reference purposes and initial mainline corridor model refinements.

Travel Times

Point-to-point travel times along the I-5 corridor were obtained from WSDOT. However, since the majority of targeted origin-destination paths were not only on I-5, the *Google Maps Directions API* was used to estimate travel times for model comparison and calibration purposes.

Signals

Signal timing and phasing data for ramp termini intersections were provided by WSDOT and the SR 509 and SR 167 project teams. Intersection signal timing and phasing data along major or minor arterials were provided by cities, counties, and, for some state routes, WSDOT.

Model Results and Findings

The results of the Gateway DTA model calibration process for the two primary performance attributes (volumes and travel times) indicate reasonable correlation with observed data. With the targeted model adjustments implemented in terms of driver response times, link speeds, traffic composition, and signal timings, the DTA model output is generally within a few minutes of observed data for travel time segments and within 5 to 10 percent of observed data for segment and arterial volumes.

Travel Time Comparison

Peak hour travel times for selected origin-destination routes from the calibrated DTA model and those representing observed data are shown in Table 4 and Table 5. A map of the point-to-point travel time routes is provided in Figure 4.

As highlighted in Table 4, model-based AM peak hour travel times for the various routes are generally within 2 to 6 minutes of actual data, which translates to a percentage difference range of roughly 3 to 20 percent. For 11 of the 14 origin-destination routes, model-based travel times are lower than observed travel times. This is likely due to the model's relative sensitivity to congestion diversion and for path reassignment compared to actual driving behavior.

Figure 4. Map of Travel Times Routes

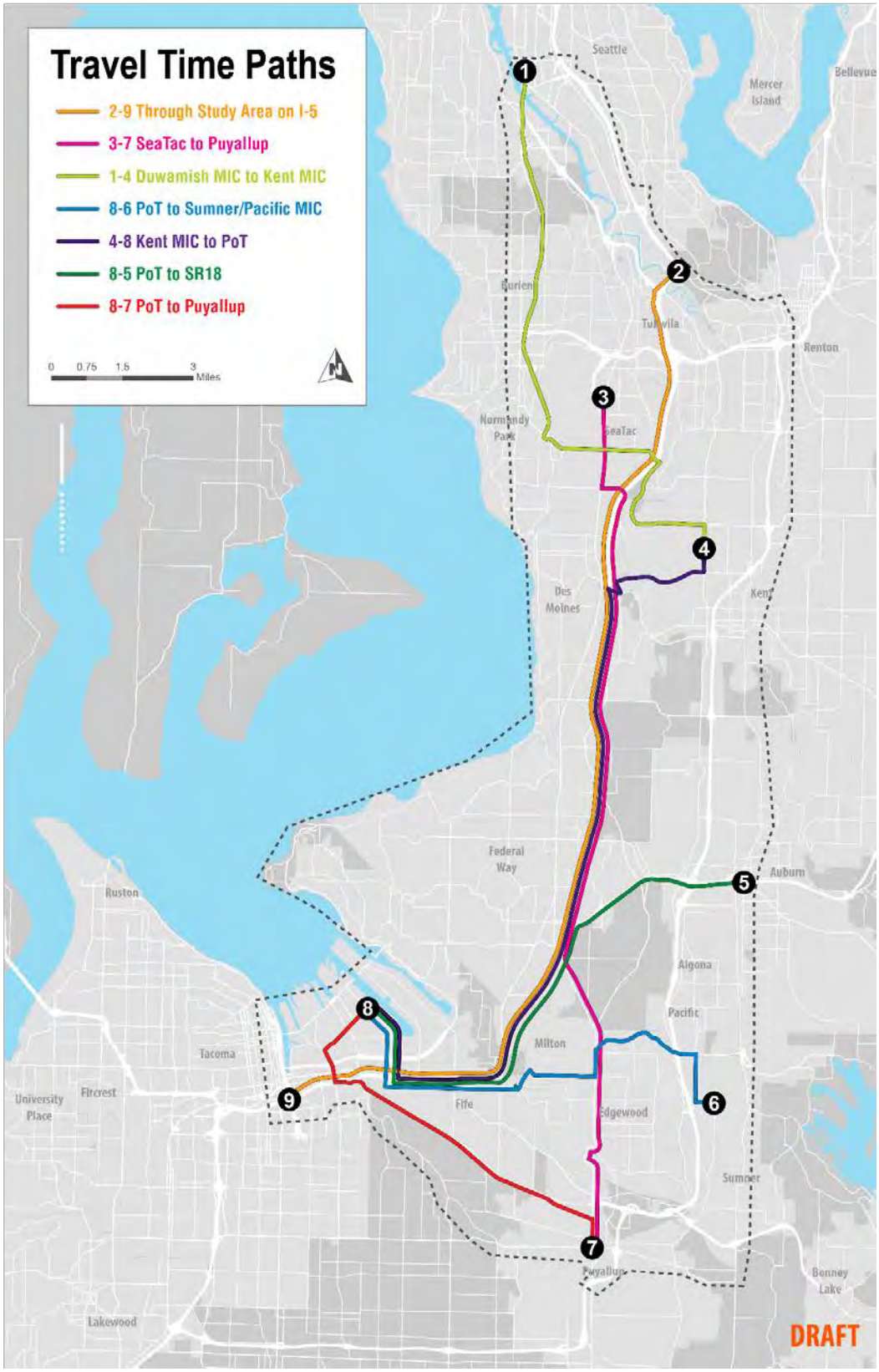


Table 4. Base Year (2015) Travel Time Comparison – AM Peak Period (7:00–8:00 am)

Travel Time Routes	Observed (2016)	Modeled (2015)	Difference
I-5 from SR 599 to I-705			
Northbound	40	38	-2
Southbound	23	25	2
SeaTac Airport to Puyallup			
Northbound	49	44	-5
Southbound	36	35	-1
Duwamish MIC to Kent MIC			
Northbound	30	27	-3
Southbound	23	22	-1
Port of Tacoma Road to Sumner/Pacific MIC			
Eastbound	29	25	-4
Westbound	28	23	-5
Port of Tacoma Road to SR 18			
Eastbound	20	17	-3
Westbound	16	17	1
Kent MIC to Port of Tacoma			
Northbound	38	32	-6
Southbound	25	23	-2
Port of Tacoma to Puyallup			
Eastbound	20	18	-2
Westbound	22	19	-3

Table 5. Base Year (2015) Travel Time Comparison – PM Peak Period (4:30–5:30 pm)

Travel Time Routes	Observed (2016)	Modeled (2015)	Difference
I-5 from SR 599 to I-705			
Northbound	25	33	8
Southbound	53	44	-9
SeaTac Airport to Puyallup			
Northbound	39	33	-6
Southbound	56	46	-10
Duwamish MIC to Kent MIC			
Northbound	25	22	-3
Southbound	26	23	-3
Port of Tacoma Road to Sumner/Pacific MIC			
Eastbound	34	29	-5
Westbound	33	28	-5
Port of Tacoma Road to SR 18			
Eastbound	23	17	-6
Westbound	35	24	-11
Kent MIC to Port of Tacoma			
Northbound	28	25	-3
Southbound	46	36	-10
Port of Tacoma to Puyallup			
Eastbound	28	24	-4
Westbound	20	20	0

Similar to the AM peak hour, model-based travel times for the PM peak hour are generally lower than observed travel times. For 12 of the 14 origin-destination routes, model-based travel times are shown to be lower than observed travel times. Compared to AM peak hour conditions, the travel time differences are slightly greater for the PM peak hour with a difference range of approximately 0 to 11 minutes. These larger differences are likely due to the high levels of congestion during the PM peak hour and more pronounced shifts to alternative routes in the DTA model, which limits demands on I-5. One exception for the PM peak hour where model-based travel times are higher than observed travel times is for the NB path from I-705 to SR 599. For this travel time route, congestion near the S 272nd Street interchange is likely overstated leading to higher than expected travel times for the overall segment.

Volume Comparison

As a second performance measure category used for calibration purposes, segment volumes and screenline-level volumes from the calibrated DTA model were compared to observed data. Scatterplot graphs comparing calibrated freeway and arterial segment model-based volumes with observed volumes for the peak hour and a midday hour for the AM and PM models are summarized in Figure 5 through Figure 8. As shown in these figures, overall correlations when all relevant freeway and arterial segments and ramps are generally strong with very few outliers noted.

Figure 5. Scatterplot Volume Comparison (7:00–8:00 am)

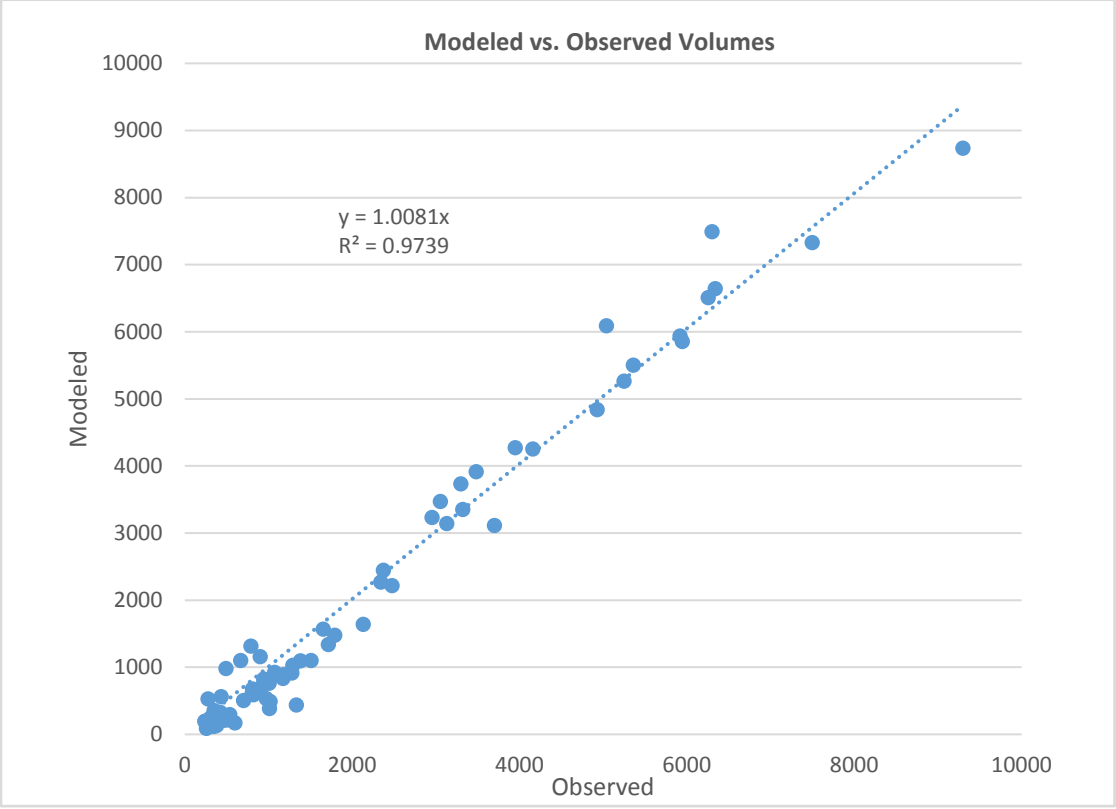


Figure 6. Volume Comparison (9:00–10:00 am)

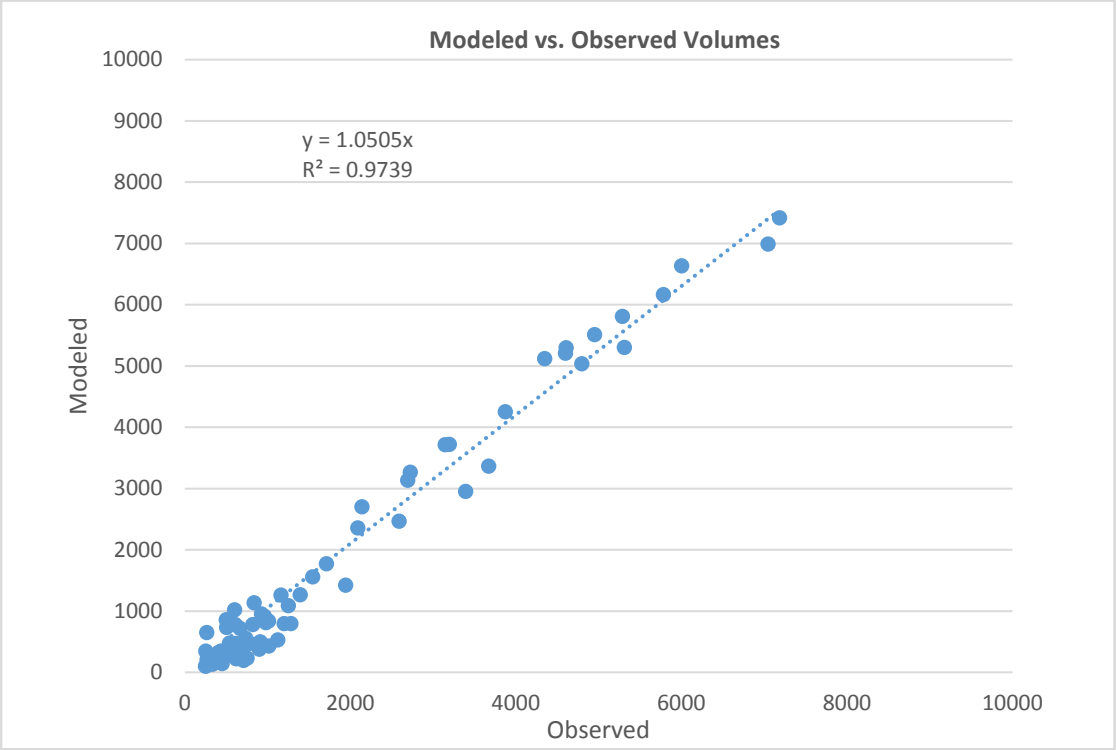


Figure 7. Volume Comparison (2:00–3:00 pm)

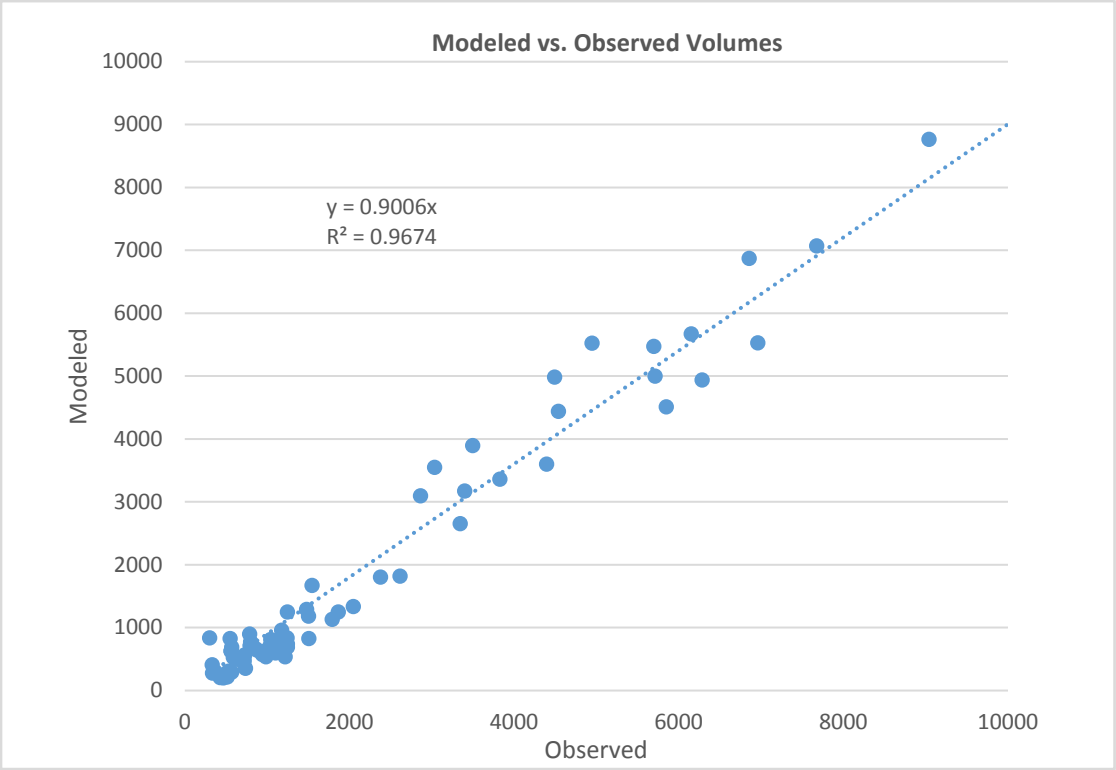
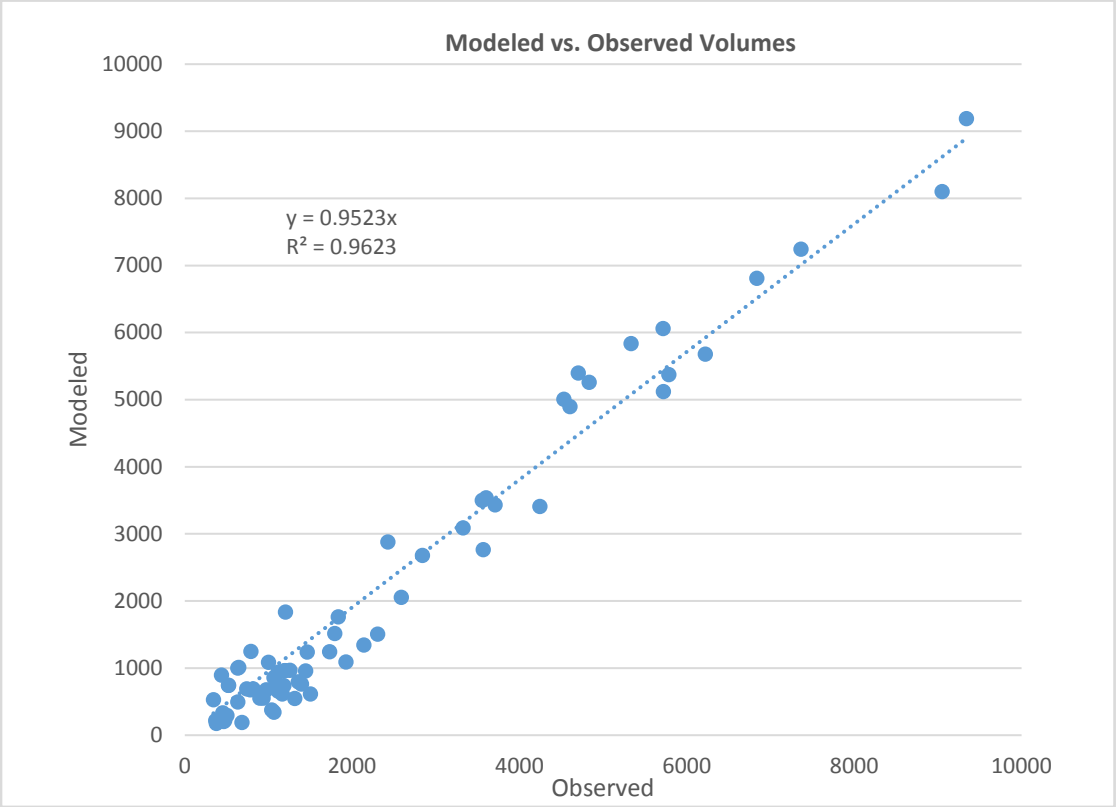


Figure 8. Volume Comparison (4:00–5:00 pm)



Screenline volumes from the DTA model were also compared to observed freeway and arterial volume data. These volumes are summarized in Table 6 and Table 7. Similar to the scatterplot graphs, the correlations between model-based volumes and observed volumes at the screenline level are reasonably strong with most model-based volume *totals* falling within 10 percent of actual observed data. Within each screenline location, variations in volume correlation were found with the greatest discrepancies noted for arterial groupings – some with differences greater than 30 percent. However, these arterial volume discrepancies are typical for DTA modeling tools, since congestion on major facilities (with the greatest demand) can influence traffic diversion off of these major facilities to alternative routes which can, in turn, result in fluctuations in traffic for arterials.

Summary Conclusions

The DTA model developed for the Gateway Program was based on Dynameq software and serves as a useful technical tool for gauging I-5 corridor performance between Tacoma/Puyallup and Seattle/ Tukwila and comparing future alternatives for the SR 167 and SR 509 Completion Projects. As typically required for traffic modeling tools, calibration of the model was needed to demonstrate reasonable and reliable replication of existing corridor volumes and travel times. The findings of the calibration process show that the model, with input adjustments and network refinements incorporated, is able to produce peak period volumes and travel times that are deemed acceptable in terms of data correlation. For the two calibration measures targeted, model-based results were generally within 5 to 10 percent of observed data for arterial volumes and screenline volumes total and within a few minutes of observed data for selected route travel times.

Table 6. Base Year (2015) Screenline Total Vehicle Volume Comparison – AM Peak Period (6:00–9:00 am)

	Observed Volumes			Estimated Volumes			
	NB/WB	SB/EB	Total	NB/WB	SB/EB	Total	Est/ Obs
South Seattle Screenline, South of S Cloverdale St							
SR 509	9,000	4,640	13,640	10,290	4,650	14,900	1.09
SR 99	4,430	3,160	7,590	3,180	2,970	6,200	0.82
I-5	19,250	16,350	35,600	21,420	16,820	38,200	1.07
Arterials	9,900	5,240	15,140	7,640	2,790	10,500	0.69
Screenline Total	42,580	29,390	71,970	42,530	27,230	69,800	0.97
SeaTac Screenline, East of SR 99							
SR 518	9,880	10,290	20,170	9,770	9,270	19,000	0.94
Arterials	4,680	3,620	8,300	3,080	3,590	6,700	0.81
Screenline Total	14,560	13,910	28,470	12,850	12,860	25,700	0.90
SeaTac Screenline, North of S 200th St							
SR 509 (1st Ave S)	1,420	640	2,060	1,500	550	2,100	1.02
SR 99 (International Blvd)	6,230	1,640	7,870	4,560	1,450	6,000	0.76
I-5	22,180	12,140	34,320	22,920	13,330	36,300	1.06
Arterials	6,250	4,160	10,410	5,450	2,450	7,900	0.76
Screenline Total	36,080	18,580	54,660	34,430	17,780	52,300	0.96
Kent/Auburn Screenline, West of W Valley Hwy							
SR 516 (Kent-Des Moines Road)	1,170	1,820	2,990	780	2,530	3,300	1.10
SR 18	9,220	9,350	18,570	10,660	9,610	20,300	1.09
Arterials	4,960	7,970	12,930	4,320	6,810	11,200	0.87
Screenline Total	15,350	19,140	34,490	15,760	18,950	34,800	1.01
Federal Way/Auburn Screenline, North of S 312th St							
SR 509 (SW Dash Point Rd)	1,780	580	2,360	1,270	450	1,700	0.72
SR 99 (Pacific Hwy S)	1,390	2,760	4,150	1,660	1,530	3,200	0.77
I-5	19,600	12,310	31,910	21,410	13,110	34,500	1.08
SR 167	12,740	8,540	21,280	13,090	9,110	22,200	1.04
Arterials	4,000	2,950	6,950	5,010	2,560	7,600	1.09
Screenline Total	39,510	27,140	66,650	42,440	26,760	69,200	1.04
County Line Screenline							
SR 509 (Marine View Dr)	1,460	2,450	3,910	2,580	2,170	4,800	1.23
SR 99 (Pacific Hwy S)	1,980	1,020	3,000	1,490	990	2,500	0.83
I-5	19,070	15,620	34,690	20,470	16,380	36,900	1.06
SR 161	3,250	1,080	4,330	2,780	540	3,300	0.76
SR 167	9930	6740	16,670	10,790	7,530	18,300	1.10
Arterials	4440	2050	6,490	5,220	1,220	6,500	1.00
Screenline Total	40,130	28,960	69,090	43,330	28,830	72,300	1.05
Fife Screenline, East of Port of Tacoma Rd							
SR 509	2,720	4,100	6,820	2,400	3,970	6,400	0.94
Pacific Hwy E	1,180	1,590	2,770	790	1,070	1,900	0.69
I-5	16,220	17,600	33,820	16,410	19,190	35,600	1.05
Arterials	1,060	1,260	2,320	520	720	1,200	0.52
Screenline Total	21,180	24,550	45,730	20,120	24,950	45,100	0.99
Fife Screenline, East of 70th Avenue E							
Valley Ave E	2,140	1,280	3,420	1,620	640	2,300	0.67
SR 167 (River Rd E)	3,290	1,890	5,180	2,330	2,280	4,600	0.89
Arterials	2,750	1,500	4,250	3,490	1,210	4,700	1.11
Screenline Total	8,180	4,670	12,850	7,440	4,130	11,600	0.90
Puyallup Screenline, North of E Main Avenue							
SR 512	9,070	6,310	15,380	9,870	5,910	15,800	1.03
SR 410	7,360	3,850	11,210	5,960	3,360	9,300	0.83
Arterials	4,290	2,160	6,450	2,510	1,630	4,200	0.65
Screenline Total	20,720	12,320	33,040	18,340	10,900	29,300	0.89

Table 7. Base Year (2015) Screenline Total Vehicle Volume Comparison – PM Peak Period (3:00–6:00 pm)

	Observed Volumes			Estimated Volumes			
	NB/WB	SB/EB	Total	NB/WB	SB/EB	Total	Est/ Obs
South Seattle Screenline, South of S Cloverdale St							
SR 509	5,430	10,850	16,280	7,950	11,930	19,900	1.22
SR 99	4,640	3,840	8,480	3,060	5,130	8,200	0.97
I-5	17,610	23,380	40,990	17,960	23,020	41,000	1.00
Arterials	5,150	10,750	15,900	3,940	7,150	11,100	0.70
Screenline Total	32,830	48,820	81,650	32,910	47,230	80,200	0.98
SeaTac Screenline, East of SR 99							
SR 518	12,490	11,540	24,030	13,250	11,190	24,400	1.02
Arterials	4,630	7,080	11,710	4,340	4,340	8,700	0.74
Screenline Total	17,120	18,620	35,740	17,590	15,530	33,100	0.93
SeaTac Screenline, North of S 200th St							
SR 509 (1st Ave S)	1,180	2,210	3,390	660	2,270	2,900	0.86
SR 99 (International Blvd)	3,140	5,360	8,500	2,570	5,330	7,900	0.93
I-5	16,400	21,950	38,350	16,550	19,380	35,900	0.94
Arterials	5,320	6,400	11,720	5,210	8,580	13,800	1.18
Screenline Total	26,040	35,920	61,960	24,990	35,560	60,500	0.98
Kent/Auburn Screenline, West of W Valley Hwy							
SR 516 (Kent-Des Moines Road)	2,920	2,580	5,500	1,330	3,150	4,500	0.82
SR 18	10,610	11,000	21,610	11,090	10,290	21,400	0.99
Arterials	8,050	6,020	14,070	10,470	4,480	15,000	1.07
Screenline Total	21,580	19,600	41,180	22,890	17,920	40,900	0.99
Federal Way/Auburn Screenline, North of S 312th St							
SR 509 (SW Dash Point Rd)	1,020	1,950	2,970	850	2,390	3,200	1.08
SR 99 (Pacific Hwy S)	4,430	3,140	7,570	2,340	3,430	5,800	0.77
I-5	15,890	24,560	40,450	15,950	21,710	37,700	0.93
SR 167	10,290	10,980	21,270	11,320	11,440	22,800	1.07
Arterials	4,520	5,790	10,310	3,960	7,580	11,500	1.12
Screenline Total	36,150	46,420	82,570	34,420	46,550	81,000	0.98
County Line Screenline							
SR 509 (Marine View Dr)	1,560	2,380	3,940	2,260	2,720	5,000	1.27
SR 99 (Pacific Hwy S)	2,200	4,000	6,200	1,670	3,250	4,900	0.79
I-5	17,570	17,240	34,810	17,790	17,910	35,700	1.03
SR 161	1,880	3,780	5,660	1,310	3,100	4,400	0.78
SR 167	8510	8140	16,650	9,990	9,610	19,600	1.18
Arterials	2780	6800	9,580	2,080	3,660	5,800	0.61
Screenline Total	34,500	42,340	76,840	35,100	40,250	75,400	0.98
Fife Screenline, East of Port of Tacoma Rd							
SR 509	6,580	5,290	11,870	6,450	3,420	9,900	0.83
Pacific Hwy E	3,620	1,640	5,260	2,740	970	3,700	0.70
I-5	16,590	18,320	34,910	19,540	18,700	38,200	1.09
Arterials	1,510	1,450	2,960	560	860	1,400	0.47
Screenline Total	28,300	26,700	55,000	29,290	23,950	53,200	0.97
Fife Screenline, East of 70th Avenue E							
Valley Ave E	1,540	2,990	4,530	1,030	2,650	3,700	0.82
SR 167 (River Rd E)	3,870	2,860	6,730	2,310	2,750	5,100	0.76
Arterials	2,060	3,220	5,280	2,700	4,990	7,700	1.46
Screenline Total	7,470	9,070	16,540	6,040	10,390	16,500	1.00
Puyallup Screenline, North of E Main Avenue							
SR 512	9,790	8,030	17,820	9,080	8,550	17,600	0.99
SR 410	5,150	7,490	12,640	4,720	5,730	10,500	0.83
Arterials	3,210	6,080	9,290	2,280	4,020	6,400	0.69
Screenline Total	18,150	21,600	39,750	16,080	18,300	34,500	0.87

Attachment H: Future (2045) Intersection LOS AM and PM Peak Hours

Table H-1: Intersection Peak Hour Level-of-Service—Existing Conditions

Int. #	Location		Intersection Type	Existing Conditions			
				AM		PM	
				Delay (sec)	LOS	Delay (sec)	LOS
1	Port of Tacoma Rd	20th Ave	Stop-controlled	0.9	A	1.7	A
2	Port of Tacoma Rd	NB I-5 on/off ramp	Yield-controlled	1.6	A	3.2	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	18	B	15.7	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	74.1	E	84.9	F
5	Port of Tacoma Rd	NB SR 509/12th St E	Signalized	19.9	B	17	B
6	Port of Tacoma Rd	N Frontage Rd (SB SR 509)	Signalized	10.8	B	19.8	B
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	15.9	B	13.5	B
8	Alexander Ave	NB SR 509	Signalized	20.1	C	30.1	C
9	Alexander Ave	SB SR 509	Signalized	29.1	C	104.8	F
10	54th Ave	Valley Ave	Signalized	16.9	B	6.8	A
11	54th Ave	23rd St	Signalized	6.4	A	6.2	A
12	54th Ave	20th St	Signalized	48.5	D	49.5	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	40.4	E	39.6	E
14	54th Ave	SB I-5 on/off ramp	Signalized	24.6	C	24.6	C
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	51.1	D	56.9	E
16	54th Ave	12th St	Signalized	5.6	A	8.7	A
17	54th Ave	8th St	Signalized	5.3	A	8.7	A
18	54th Ave	4th St	Stop-controlled	0.9	A	1.2	A
19	54th Ave	SR 509/Taylor Way	Signalized	41.4	D	60.7	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	22.3	C	28.3	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	46.1	D	27.9	C
22	70th Ave	20th Ave	Signalized	34.4	C	75.6	E
23	70th Ave	Valley Ave	Signalized	30.2	C	35.4	D
24	70th Ave	North Levee Rd	Stop-controlled	7.1	A	37.7	E
25	Pioneer Way	WB SR 512	Signalized	11.1	B	17.4	B
26	Pioneer Way	EB SR 512	Signalized	8.7	A	9.4	A
27	66th St	River Rd E (SR 167)	Signalized	84.6	F	72.1	E
28	66th St	North Levee Rd	Stop-controlled	25.4	D	12.3	B
29	Freeman Rd	20th Ave/Yuma St	Signalized	14.4	B	31.5	C
30	Freeman Rd	Valley Ave	Signalized	15.7	B	28.9	C
31	82nd Ave	North Levee Rd	Stop-controlled	1.6	A	4	A
32	N Meridian Ave	River Rd E (SR 167)	Signalized	21.6	C	34.2	C
33	N Meridian Ave	4th St NE	Stop-controlled	0.8	A	1.3	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	3.4	A	6.4	A
35	N Meridian Ave	SR 167	Signalized	45.4	D	54.9	D
36	N Meridian Ave	Valley Ave	Signalized	31.9	C	39.4	D
37	34th Ave	20th Ave	Future Signal	N/A	N/A	N/A	N/A
38	34th Ave	SR 99 (Pacific Hwy)	Future Signal	N/A	N/A	N/A	N/A
39	54th Ave	SR 167	Future Signal	N/A	N/A	N/A	N/A
40	SR 99 (Pacific Hwy)	70th Ave	Future Signal	N/A	N/A*	N/A	N/A
41	Valley Ave	SR 167 NB Ramps	Future Signal	N/A	N/A	N/A	N/A
42	Valley Ave	SR 167 SB Ramps	Future Signal	N/A	N/A	N/A	N/A
43	SR 167	NB I-5 Ramp	Future Signal	N/A	N/A	N/A	N/A
44	SR 167	SB I-5 Ramp	Future Signal	N/A	N/A	N/A	N/A

D = At LOS threshold

E or F = Falls below LOS threshold

Table H-2. Future (2045) AM Peak Hour Intersection Level of Service

Int#	Location		Intersection Type	AM Peak Hour			
				No Build		Build	
				Delay (sec)	LOS	Delay (sec)	LOS
1	Port of Tacoma Rd	20th Ave	Signalized	18	B	13	B
2	Port of Tacoma Rd	NB I-5 on/off ramp	Signalized	8.6	A	5.4	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	9.4	A	12.3	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	27.3	C	23.8	C
5	Port of Tacoma Rd	NB SR 509/12th St E	Signalized	17.4	B	8	A
6	Port of Tacoma Rd	SB SR 509	Signalized	12.3	B	9.6	A
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	67.7	E	21.1	C
8	Alexander Ave	NB SR 509	Signalized	89.4	F	35.8	C
9	Alexander Ave	SB SR 509	Signalized	90.1	F	51.6	D
10	54th Ave	Valley Ave	Signalized	30.9	C	13	B
11	54th Ave	23rd St	Signalized	15.4	B	7.9	A
12	54th Ave	20th St	Signalized	65.3	E	40.9	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	61.6	F	4.1	A
14	54th Ave	SB I-5 on/off ramp	Signalized	28.6	C	21.9	C
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	74.7	E	64.1	E
16	54th Ave	12th St	Signalized	7	A	6.7	A
17	54th Ave	8th St	Signalized	8.9	A	9.1	A
18	54th Ave	4th St	Stop-controlled	0.9	A	0.8	A
19	54th Ave	SR 509/Taylor Way	Signalized	66.4	E	47.4	D
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	108.9	F	18.1	B
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	80.3	F	7.5	A
22	70th Ave	20th Ave	Signalized	43.3	D	32.4	C
23	70th Ave	Valley Ave	Signalized	42.4	D	22.3	C
24	70th Ave	North Levee Rd	Stop-controlled	74.2	F	10.7	B
25	Pioneer Way	WB SR 512	Signalized	12.2	B	10.9	B
26	Pioneer Way	EB SR 512	Signalized	58.7	E	58.6	D
27	66th St	River Rd E (SR 167)	Signalized	78.8	E	79.4	E
28	66th St	North Levee Rd	Stop-controlled	34.7	D	34.6	D
29	Freeman Rd	20th Ave/Yuma St	Signalized	48.7	D	26.1	C
30	Freeman Rd	Valley Ave	Signalized	27.5	C	8.2	A
31	82nd Ave	North Levee Rd	Stop-controlled	1.5	A	1.5	A
32	N Meridian Ave	River Rd E SR 167	Signalized	69.6	E	35.9	D
33	N Meridian Ave	4th St NE	Stop-controlled	1	A	1.5	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	31.5	D	8.2	A
35	N Meridian Ave	SR 167	Signalized	56	E	39.6	D
36	N Meridian Ave	Valley Ave	Signalized	55.7	E	48.3	D
37	34th Ave	20th Ave	Future Intersection	3.2	A	2	A
38	34th Ave	SR 99 (Pacific Hwy)	Future Intersection	16.4	B	12.4	B
39	54th Ave	SR 167	Future Intersection	N/A	N/A	12.9	B
40	SR 99 (Pacific Hwy)	70th Ave	Future Intersection	N/A	N/A	25.9	C
41	Valley Ave	SR 167 NB Ramps	Future Intersection	N/A	N/A	16.8	B
42	Valley Ave	SR 167 SB Ramps	Future Intersection	N/A	N/A	8.2	A
43	SR 167	NB I-5 Ramp	Future Intersection	N/A	N/A	33.4	C
44	SR 167	SB I-5 Ramp	Future Intersection	N/A	N/A	17.7	B

D	= At LOS threshold
E or F	= Falls below LOS threshold

Table H-3. Future (2045) PM Peak Hour Intersection Level of Service

Int#	Location		Intersection Type	PM Peak Hour			
				No Build		Build	
				Delay (sec)	LOS	Delay (sec)	LOS
1	Port of Tacoma Rd	20th Ave	Signalized	11	B	11	B
2	Port of Tacoma Rd	NB I-5 on/off ramp	Signalized	8	A	7.6	A
3	Port of Tacoma Rd	SB I-5 on/off ramp	Signalized	18.4	B	11.3	B
4	Port of Tacoma Rd	SR 99 (Pacific Hwy)	Signalized	41.9	D	23.2	C
5	Port of Tacoma Rd	NB SR 509/12th St E	Signalized	23.9	C	12.9	B
6	Port of Tacoma Rd	SB SR 509	Signalized	25.9	C	26.1	C
7	Alexander Ave	SR 99 (Pacific Hwy)	Signalized	18.3	B	18.7	B
8	Alexander Ave	EB SR 509	Signalized	25.8	C	37.7	D
9	Alexander Ave	WB SR 509	Signalized	183.6	F	56.7	E
10	54th Ave	Valley Ave	Signalized	7.3	A	6.9	A
11	54th Ave	23rd St	Signalized	8.6	A	8.8	A
12	54th Ave	20th St	Signalized	64.3	E	42.4	D
13	54th Ave	NB I-5 on/off ramp	Yield-controlled	36.5	E	26	D
14	54th Ave	SB I-5 on/off ramp	Signalized	16.7	B	17	B
15	54th Ave	SR 99 (Pacific Hwy)	Signalized	75.9	E	46.4	D
16	54th Ave	12th St	Signalized	18.8	B	10.3	B
17	54th Ave	8th St	Signalized	11.5	B	17.2	B
18	54th Ave	4th St	Stop-controlled	1.1	A	1.1	A
19	54th Ave	SR 509/Taylor Way	Signalized	119.6	F	62.2	E
20	SR 99 (Pacific Hwy)	Porter Way	Signalized	137	F	30.6	C
21	SR 99 (Pacific Hwy)	70th Ave	Signalized	83.2	F	15.7	B
22	70th Ave	20th Ave	Signalized	158.1	F	25.1	C
23	70th Ave	Valley Ave	Signalized	51.6	D	23.9	C
24	70th Ave	North Levee Rd	Stop-controlled	363.9	F	7.5	A
25	Pioneer Way	WB SR 512	Signalized	13.4	B	1.3	A
26	Pioneer Way	EB SR 512	Signalized	24.4	C	50	D
27	66th St	River Rd E (SR 167)	Signalized	63.5	E	70.4	E
28	66th St	North Levee Rd	Stop-controlled	12.5	B	9.5	A
29	Freeman Rd	20th Ave/Yuma St	Signalized	52.9	D	11.6	B
30	Freeman Rd	Valley Ave	Signalized	69.4	E	18	B
31	82nd Ave	North Levee Rd	Stop-controlled	6	A	3	A
32	N Meridian Ave	River Rd E SR 167	Signalized	105.5	F	23	C
33	N Meridian Ave	4th St NE	Stop-controlled	2.1	A	1.1	A
34	N Meridian Ave	North Levee Rd	Stop-controlled	10.2	B	4.5	A
35	N Meridian Ave	SR 167	Signalized	39.8	D	46.3	D
36	N Meridian Ave	Valley Ave	Signalized	81.1	F	42.7	D
37	34th Ave	20th Ave	Future Intersection	2.4	A	1.4	A
38	34th Ave	SR 99 (Pacific Hwy)	Future Intersection	18.4	B	18.8	B
39	54th Ave	SR 167	Future Intersection	N/A	N/A	10.5	B
40	SR 99 (Pacific Hwy)	70th Ave	Future Intersection	N/A	N/A*	43.4	D
41	Valley Ave	SR 167 NB Ramps	Future Intersection	N/A	N/A	13	B
42	Valley Ave	SR 167 SB Ramps	Future Intersection	N/A	N/A	12.2	B
43	SR 167	NB I-5 Ramp	Future Intersection	N/A	N/A	20	B
44	SR 167	SB I-5 Ramp	Future Intersection	N/A	N/A	23.7	C

*In the No build, the original location fo the SR 99/70th Ave E. intersection is projected to operate at LOS F (see intersection #21)

D = At LOS threshold

E or F = Falls below LOS threshold

PUGET SOUND GATEWAY PROGRAM – PHASE 1 OF THE SR 167 COMPLETION PROJECT

Environmental Justice Discipline Report

Prepared for
Washington State Department of Transportation

Prepared by
PRR

July 2018

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Executive Summary

What is the study approach?

WSDOT prepared this memorandum in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. This memorandum evaluates the benefits and impacts of the Phase 1, SR 167 Completion Project to environmental justice populations.

To evaluate the benefits and impacts of SR 167 Phase 1 Improvements on environmental justice populations, WSDOT began by determining if minority, low-income, and/or limited English proficient individuals live in the project study area or will use the future extension of SR 167 and SR 509 Spur. Next, WSDOT identified any new benefits or adverse impacts of Phase 1 to environmental justice populations as compared to the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation (2006 FEIS)*. WSDOT used demographic analyses and feedback from public involvement activities to determine if any of these benefits or adverse impacts will disproportionately affect environmental justice populations and, if so, whether the adverse impacts will be high or severe. WSDOT identified mitigation to avoid or minimize any disproportionately high and adverse impacts to environmental justice populations.

What are the existing conditions?

Current demographic analyses confirm that individuals who identify as minorities, households with low incomes, and persons who are limited English proficient live or work in the project study area. There are also minority, low-income, and/or limited English proficient individuals living in the SR 167 Phase 1 travelshed, which is the geographic area from which traffic on the proposed SR 167 Phase 1 Improvements will originate.

Are there new or significant impacts as a result of the proposed project on environmental justice populations compared to the 2006 FEIS Build Alternative?

Most construction and operational effects of Phase 1 to environmental justice populations will be the same or less than those documented in the 2006 FEIS. The main change is that Phase 1 would include tolling of the entire new highway facility. Other than the High Occupancy Toll (HOT) Lanes on SR 167 from Puyallup to Renton, in which two-person carpools may travel free of charge and single-occupant motorists may choose to pay a toll to use the lanes, no tolls will be charged on existing SR 167 facilities in the project area.

Any toll—even relatively low-cost tolls like the ones planned for this project—disproportionately affects low-income households. Compared to households with moderate and high incomes, the toll would represent a higher proportion of annual income for low-income households. Furthermore, all-electronic tolling could disproportionately affect individuals who do not have debit card, credit card, or EBT accounts, do not have enough funds to start an electronic toll account, or do not have Internet access. Many of these individuals are low-income and/or limited English proficient. As such, low-income and/or limited English proficient individuals may not be able to derive the same benefits from the new SR 167 facility as middle- and higher-income individuals.

Current local routes and arterials will remain accessible alternatives to the new tolled facility and are expected to offer nearly the same or slightly improved travel times for both motorists and transit over the No Build conditions for most routes and travel periods. As such, the disproportionate impact of tolls on environmental justice populations would not be high and adverse.

What measures will WSDOT take to avoid or minimize new impacts to environmental justice populations?

For most construction and operational impacts to environmental justice populations, mitigation measures for the proposed SR 167 Phase 1 Improvements would be the same as those documented in the 2006 FEIS.

The tolls would disproportionately affect low-income populations and could also disproportionately affect limited English proficient populations, but because these effects would not be high and adverse, they do not require mitigation. That said, to minimize the effects of the all-electronic toll collection system on limited English proficient motorists, WSDOT will translate information about electronic tolling into multiple languages and distribute it throughout the SR 167 travelshed. In interviews with service providers conducted by WSDOT, participants recommended translation into Cambodian, Korean, Russian, Spanish, and Vietnamese.

In addition, WSDOT anticipates exempting transit and paratransit (special transportation services for people with disabilities) from the tolls, which should further minimize the impacts of tolls on environmental justice populations. WSDOT exempts transit and paratransit on existing tolled facilities, but the Washington State Transportation Commission makes the final decision about toll exemptions. WSDOT is also planning to continue making it easier for people without a bank account to purchase and preload a *Good to Go!* pass—for example, selling them in local grocery stores and pharmacies and allowing people to use cash to load them. WSDOT is planning to expand the network for retail pass sales and options for unbanked customers, but at the time of publication of this discipline report, there were no concrete details about the expansion.

Would Phase 1 Improvements have any new impacts not disclosed in the 2006 FEIS that would have a disproportionately high and adverse effect on environmental justice populations?

The adverse impacts to environmental justice populations described in this report are similar to those described in the 2006 FEIS, with one important exception: The 2006 FEIS did not assume the project would be tolled. The current analysis considers the effects of tolling on environmental justice populations. WSDOT concluded that, with accessible and convenient untolled alternatives available, tolling the new proposed SR 167 Phase 1 Improvements would not have a disproportionately high and adverse effect on environmental justice populations.

1. Introduction

The SR 167 Completion Project is one of two projects that comprise the WSDOT Puget Sound Gateway Program. The other project is the SR 509 Completion Project.

WSDOT prepared this memorandum in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares changes to the SR 167 Completion Project and resulting benefits or adverse impacts to the effects documented in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS) and Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if these changes would result in any new significant impacts. This document discusses changes in the project, applicable laws or regulations, and the project study area as they relate to environmental justice.

What is environmental justice?

Environmental justice acknowledges that the quality of our environment affects our lives and that negative environmental effects should not disproportionately burden low-income or minority populations.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between:

- The Puyallup termini of SR 167, SR 410, and SR 512; and
- The Interstate 5 (I-5) corridor, the new SR 509 Spur, and the Port of Tacoma.

The project intends to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor.

The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

Project Background

The SR 167 Completion Project has been developed through many years of cooperative efforts between the Washington State Department of Transportation (WSDOT); Federal Highway Administration (FHWA); Pierce County; the cities of Puyallup, Fife, Edgewood, Milton, and Tacoma; and the Puyallup Tribe of Indians.

The 2006 FEIS described the Build Alternative to complete the SR 167 freeway by building approximately 4 miles of a new four-lane divided highway facility (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction from its current terminus in Puyallup at SR 161, through the Puyallup River Valley, and connecting to I-5 near the 70th Avenue undercrossing. The 2006 FEIS project also included a new, approximately 2-mile divided highway section (two general purpose lanes in each direction) from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. Figure 1a shows a map depicting the 2006 Build Alternative and Figure 1b depicts the Proposed Phase 1 Improvements.

The scope of the 2006 Build Alternative did not include tolling. Therefore, the 2006 FEIS did not consider or evaluate tolling impacts.

Figure 1a. 2006 FEIS Build Alternative



Figure 1b. Proposed Phase 1 Improvements



2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of certain work elements like the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The proposed Phase 1 Improvements footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS. Figure 2 shows a Vicinity Map of the Phase 1 Improvements.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately 4 miles of a new four-lane limited access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately 2-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully-tolled facility based on Legislative intent. See Table 1 - Comparison of Design Components for specifics regarding the scope of the Phase 1 improvements.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude them. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol weigh stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD with the proposed Phase 1 Improvements.

Figure 2. Phase 1 Improvements Vicinity Map

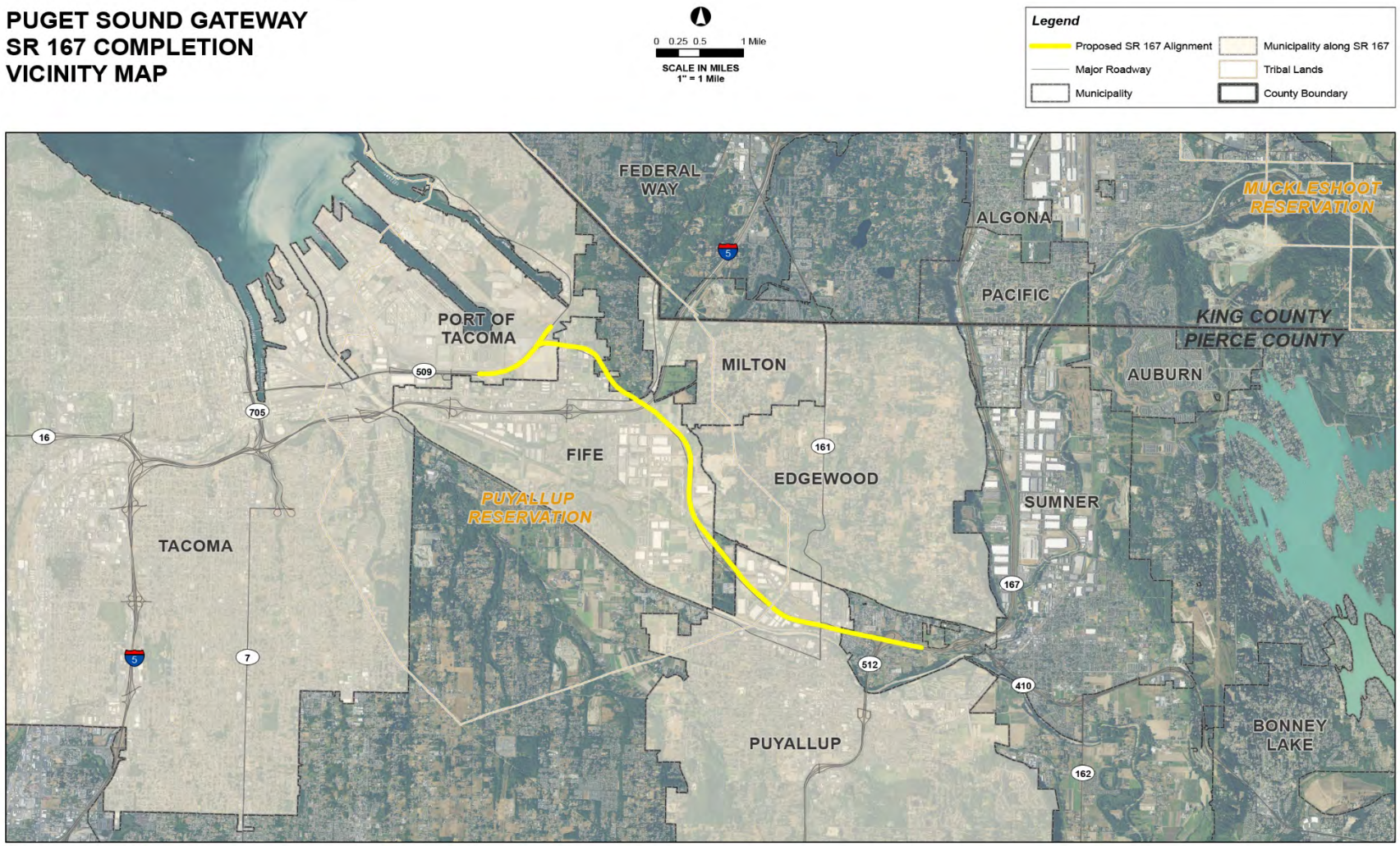

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave	Direct connection (single lane in each direction) at grade connection east of Alexander Ave
54th Avenue East Interchange	Southbound diamond off-ramp and a northbound loop on-ramp (single lane ramps)	½ SPUI to the east
SR 509 54th Avenue E to I-5	Four 90-ft lanes, 60 MPH posted speed	Four 78-ft lanes, 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including direct-connect HOV ramps	Diverging diamond interchange; no direct-connect HOV ramps
SR 167 I-5 to Valley Avenue	Six 152-ft lanes: 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	Four 78-ft lanes: 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right-hand loop off-ramp and southbound on-ramp (single lane ramps), northbound diamond off-ramp and on-ramp	½ diamond interchange to the north
SR 167 Valley Avenue to SR 161	Six 152-ft lanes: 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	Four 78-ft lanes: 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	Two total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a half-diamond interchange with an on- and off-ramp that serves traffic to and from one direction.

3. What methods were used to analyze Phase 1 Improvements and how do they differ from those used for the 2006 FEIS Build Alternative?

WSDOT conducted an environmental justice analysis in 2004 to support the 2006 FEIS. Since that time, the discipline of environmental justice and the tools for analysis have evolved. Federal and state guidelines continue to refine definitions of disproportionately affected populations and the methodology for conducting an environmental justice analysis. For example, the analysis conducted for the 2006 FEIS did not consider effects to limited English proficient populations. Since 2011, WSDOT has required that environmental justice analyses consider effects to limited English proficient populations, especially because there is some overlap between impacts to these populations and other environmental justice groups.

Study Area

To analyze potential effects of construction and operation of the new proposed SR 167 Phase 1 Improvements on environmental justice populations, WSDOT used the same study area as described in the 2006 FEIS environmental justice analysis, which included the geographic area within 1/2 mile of the project alignment. Figure 3 shows the SR 167 Phase 1 Improvements study area.

To analyze potential benefits and adverse effects of tolling on environmental justice populations, WSDOT examined the forecasted travelshed for the future SR 167 Phase 1 Improvements tolled facility. The travelshed is the geographic area from which users of the future SR 167 tolled facility will originate. The tolled portion of the new SR 167 facility does not exist yet, so WSDOT had to make educated assumptions about where users of the future SR 167 facility will originate. WSDOT used regional traffic models to make these educated assumptions (WSDOT 2017).

The geographic boundaries of the SR 167 Phase 1 Improvements travelshed are roughly:

- North to SR 516 in Kent
- South to the towns of Spanaway, Fredrickson, and City of Orting
- West to SR 7 and the Tacoma Narrows
- East to SR 169

Figure 4 shows the travelshed for the proposed SR 167 Phase 1 Improvements.

177 Figure 3. SR 167 Phase 1 Improvements Study Area – ½ Mile

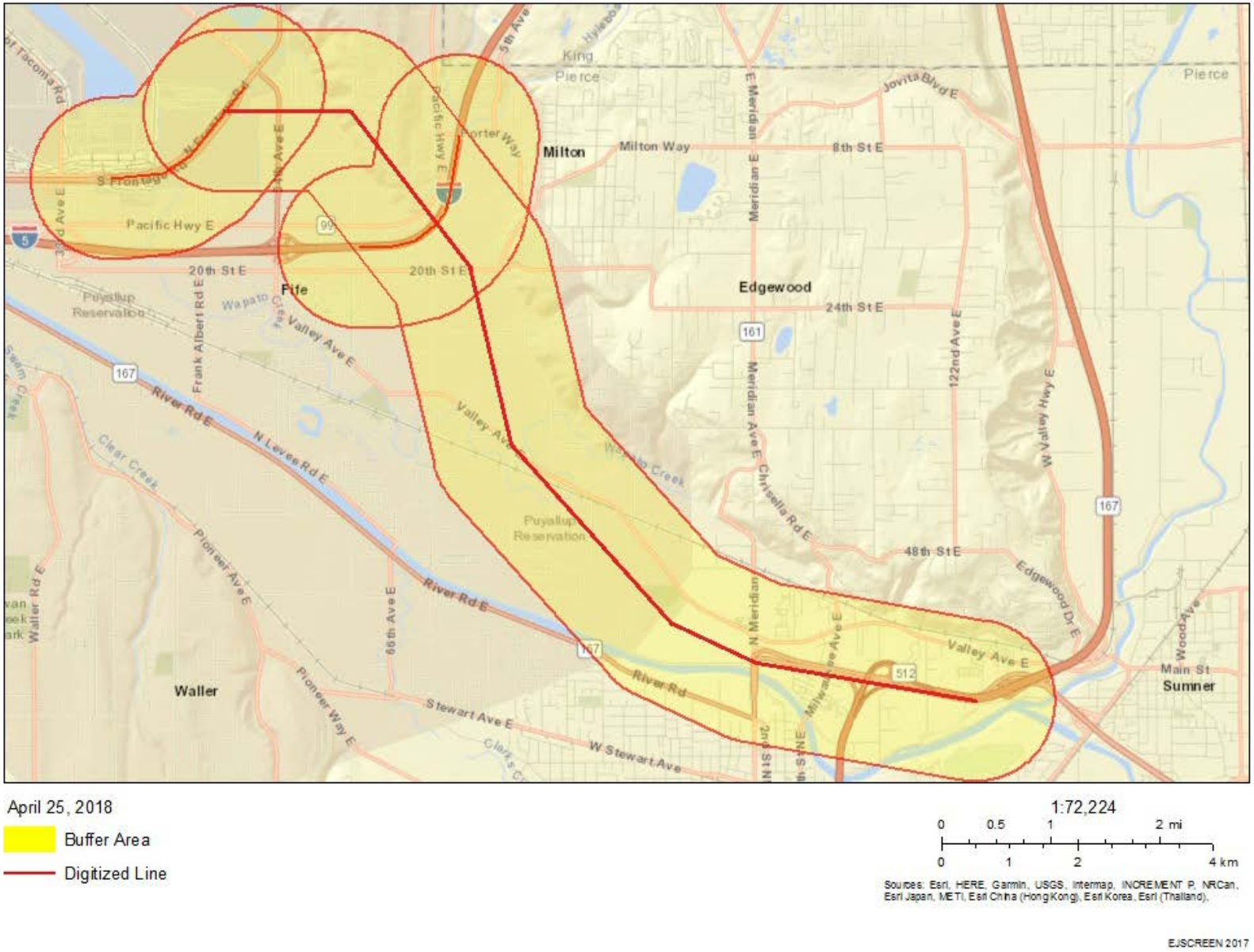

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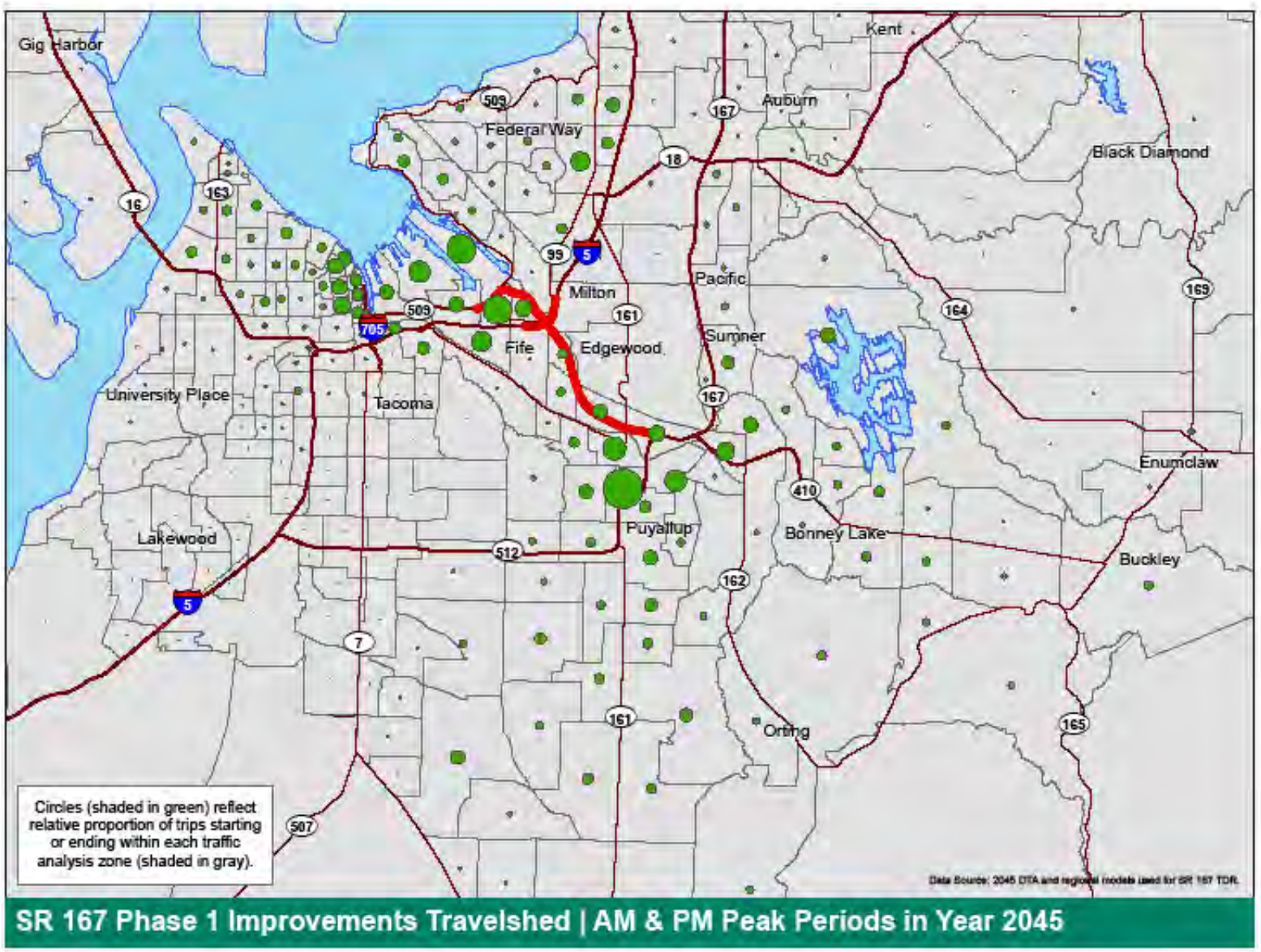
Figure 4: SR 167 Phase 1 Improvements Travelshed



Data Collection

The 2006 FEIS used the Census data available at that time, which was from the 2000 Decennial Census. To show how demographics in the project area have changed since the 2006 FEIS, WSDOT compared the demographic data from the 2000 Census to the most recently available demographic data from American Community Survey five-year estimates. Sources of data informing this Phase 1 Improvements analysis of potential effects and benefits include the following:

- 2000 Decennial Census (U.S. Census Bureau)
- American Community Survey (ACS) five-year estimates, 2011-2015 and 2012-2016 (U.S. Census Bureau)
- Demographic data from the Washington State Office of the Superintendent of Public Instruction (OSPI) for the 2016–2017 school year
- "EJScreen" (an online tool and service provided by the U.S. Environmental Protection Agency) data on minority, low-income, and limited English proficient populations

Although ACS data are estimates, for the purpose of this analysis, the estimates are more useful than using 2010 Census data alone because 2010 Census data is almost 10 years old (it was collected in 2009). WSDOT used these data to identify potentially affected populations and neighborhoods in the project study area and travelshed of the proposed Phase 1 Improvements.

Public Involvement

Public involvement with communities in the study area has influenced the scope of the new proposed Phase 1 Improvements. Members of the public have had an opportunity to review several design options, varying from the 2006 FEIS Build Alternative to options that would use a much smaller footprint and have substantially fewer impacts. Through this outreach and engagement, WSDOT was able to reflect community and stakeholder input in the development of the scope and design for the Phase 1 Improvements. One example of how WSDOT modified the Phase 1 scope to address public input is incorporating the suggestion to move the shared-use path in the SR 509 Spur area of the project to the east side of the alignment and merge into the existing trail system of the Hylebos and Milgard Nature Areas.

Since planning began for the Phase 1 Improvements in 2015, WSDOT held two rounds of public open houses (March 2016 and April 2017). Over 150 people attended the open houses in March 2016, and nearly 200 people attended the open house in April 2017. For the 2016 open houses, WSDOT notified community members through group email lists, social media, news releases, and English and Spanish-language flyers provided to cities and school districts in the project area. For the open house in 2017, WSDOT used these same methods and also mailed postcards—which were translated into Spanish—to nearly 10,250 households and local businesses.

WSDOT formed a Steering Committee comprised of staff from the local jurisdictions in the study area and an Executive Committee composed of elected officials from jurisdictions within the study area. WSDOT held six Steering Committee meetings and four Executive Committee meetings from December 2016 to May 2017.

In addition, to develop and inform consultation strategies with environmental justice communities on the project, from November 1, 2016 to November 28, 2016, WSDOT scheduled and conducted interviews with 10 community-based organizations and social service providers in the study areas:

- FISH Food Bank
- Korean Women's Association

- Metropolitan Development Center
- Pierce County Housing Authority
- SeaMar Community Health Centers
- The Reach Center
- Tacoma Community House
- Tacoma Housing Authority
- Tacoma/Pierce County Affordable Housing Consortium
- Tacoma Rescue Mission

These organizations also helped distribute emails about the April 2017 open houses to their constituents and clients.

As part of this environmental justice analysis, WSDOT studied summaries from these service provider interviews, as well as summaries from the public open houses and Steering Committee and Executive Committee meetings. WSDOT looked for issues of concern for low-income, minority, and/or limited English proficient populations to explore further in this environmental justice analysis. WSDOT used results from this public involvement to identify potentially affected populations, neighborhoods, social resources, public services, and community cohesion in the study areas, potential benefits and adverse impacts of the Phase I improvements, and potential mitigation for adverse impacts. The public involvement process also informed development of potential mitigation for the potential adverse effects of tolling.

The following summarizes questions and concerns from public involvement activities for Phase 1:

- Most social service provider staff and clients were unfamiliar with the SR 167 project and how tolling would work.
- Some people expressed a desire for more outreach about the SR 167 project and suggested using non-traditional approaches, such as community events and partnering with employers and small businesses, to get the word out.
- Some people expressed concerns about the effects of tolls on low-income households. They asked if exemptions from the tolls would be available to low-income households. Some people also worried that the existing transit system would not be adequate for people unable to afford the toll.

Tribal Consultations

Tribes are considered environmental justice populations, and approximately three-quarters of the project is located within the Puyallup Tribe of Indians (PTOI) reservation.

WSDOT engages with potentially affected tribes through multiple approaches. These include an established Section 106 process for identifying and protecting cultural resources (historic and archaeological), the previously mentioned Executive and Steering Committee meetings, technical assistance and advisory groups, and formal government to government consultation.

Prior to the 2006 FEIS, WSDOT consulted the PTOI to secure information about traditional cultural properties, culturally sensitive locations, fish passage, or other effects to the tribe within or adjacent to the project area. Since then, WSDOT has held two formal consultations with the PTOI in April 2016 and June 2017. The purpose of the first consultation was to provide a project update and discuss tribal concerns related to property impacts, tolling, and natural and cultural resources. The second

consultation was to provide a project update and discuss the tribe's concerns about tolling through the reservation.

The State of Washington and the PTOI are party to the Puyallup Tribe Land Claims Settlement Agreement of August 28, 1988, ratified by Congress in P.L. 101-41, implemented in part by Washington state legislation enacted in 1989, adopted by the court in Puyallup Tribe of Indians v. Union Pacific Railroad Co., Civil No. C84-359TC (W.E. Wash. March 24, 1990), and to the subsequent modifications. Consistent with the terms of the land claims settlement agreement and subsequent modifications, WSDOT agrees it will not collect tolls on Puyallup tribal members and tribal government vehicles traveling on state highways within the surveyed 1873 Puyallup Reservation boundaries. An agreement between WSDOT and the Puyallup Tribe of Indians for these exemptions from any tolls is nearing completion for final signatures.

WSDOT will continue to consult with the PTOI via the processes described above—including ongoing environmental justice outreach—throughout the design and construction of the Phase 1 Improvements. Government to government consultation is ongoing and no agreements have been made to date.

Analytical Techniques and Models

This environmental justice discipline report uses similar analytical techniques and models to the 2006 FEIS. To identify potential impacts on minority and/or low-income populations, as well as limited English proficient residents, WSDOT met with project team members and reviewed applicable technical reports being prepared in support of the NEPA Re-Evaluation (e.g., Noise; Displacement, Disruption and Relocation; Land Use, etc.) to find answers to the following questions:

- How would construction and operation of the proposed SR 167 Phase 1 Improvements adversely affect environmental justice populations? Would any of these adverse effects be different from those evaluated in the 2006 FEIS?
- How would construction and operation of the proposed project specifically benefit environmental justice populations? Are any of these benefits different from those evaluated in the 2006 FEIS?

WSDOT identified potential new adverse effects or benefits and isolated the new project effects that would affect people differently, such as noise or increased traffic congestion.

Next, WSDOT determined whether any adverse effects would disproportionately affect low-income and/or minority populations. WSDOT used EJScreen to overlay the geographic areas that will be affected by the project with the demographic information for these areas. This allows comparison of the minority and/or poverty status of those who would be affected by the Phase 1 Improvements to those not affected by the project. This document also compares the limited English proficient status of those who would be affected by the project to those not affected, which is new to the 2018 evaluation and was not considered in the 2006 Environmental Justice Discipline Report.

A minority is an individual who identifies himself as Black (a person having origins in any of the black racial groups of Africa); Hispanic (a person of Mexican, Puerto Rican, Cuban, Central American or South American, or other Spanish culture or origin, regardless of race); Asian (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); American Indian/Alaskan Native (a person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition); or some other race.

A low-income person is an individual whose household income falls below the federal poverty guidelines, as defined by the U.S. Department of Health and Human Services. For 2017, the federal poverty guideline for a household of four in one of the 48 contiguous states and Washington D.C. is $24,600.

Figures 7 and 8 and Figures 10 through 15 in this document summarize the outcomes from this demographic analysis.

The next step was to determine whether any of these effects met the U.S. Department of Transportation (USDOT) definition of a disproportionately high and adverse effect. According to USDOT, a disproportionately high and adverse effect on minority and/or low-income populations is an adverse effect that:

- Is predominantly borne by a minority population and/or a low-income population, or
- Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population. (USDOT, https://www.fhwa.dot.gov/Environment/environmental_justice/, 2015)

WSDOT also considered the following:

- Are there reasonable and feasible measures to avoid or minimize disproportionately high and adverse effects?
- Are there any project benefits that would affect low-income and/or minority populations?
- Did WSDOT modify the project to avoid or minimize disproportionately high and adverse effects?

Methods to Analyze Tolling

The 2006 FEIS did not analyze tolling. To identify potential impacts of the toll and the all-electronic toll system on low-income, minority, and/or limited English proficient populations for this 2018 analysis, WSDOT created demographic maps of the travelshed for the Phase 1 Improvements using data from EJScreen. WSDOT created three demographic maps of the travelshed: low-income populations in the travelshed, minority populations in the travelshed, and limited English proficient populations in the travelshed.

To evaluate whether the effect of tolls and all-electronic tolling on low-income and limited English proficient populations would be considerably more severe or greater in magnitude than the adverse effects suffered by the general population, WSDOT:

- Compared cost of the toll for low-income households to the cost for average households. WSDOT calculated the average cost of the toll per year per user and compared the percentage of household income the toll would represent for different types of households (e.g., below federal poverty level, median household income).
- Estimated costs in additional travel time and vehicle operating costs of using untolled alternate routes. Using traffic forecast models, WSDOT compared forecasted travel times during peak periods.
- Estimated surcharges from using pay by mail tolling for individuals who do not have access to a debit or credit card with which to open and maintain a *Good to Go!* account. (If a motorist does not have a *Good to Go*! account and uses a toll facility, WSDOT will send a Pay by Mail toll bill to the vehicle's registered owner with the Washington Department of Licensing.)

Methods to Analyze Indirect and Cumulative Effects

For the purposes of NEPA, an indirect effect is one that is caused by the proposed action and is reasonably foreseeable but would happen later in time or in another location. Indirect effects could

include changes in the pattern of land use, population density, or growth. Cumulative effects are either those that come from risk over time or effects caused by multiple projects in one geographic area.

For this 2018 analysis, WSDOT reviewed regional transportation plans including the Transportation 2040 (Puget Sound Regional Council) and Sound Transit 2 and 3 to identify reasonable and foreseeable projects separate from the SR 167 Phase 1 Improvements that could benefit or impact neighborhoods, social resources, or environmental justice populations. Note that not all long-range plans consider effects to environmental justice populations. WSDOT also considered current tolled facilities such as the existing SR 167 HOT Lanes from Puyallup to Renton, future express toll lanes on I-405 between Renton and Bellevue and current express toll lanes on I-405 between Bellevue and Lynnwood, future tolling of the SR 509 extension in Burien and Des Moines, and the Tacoma Narrows Bridge. WSDOT also coordinated with the authors of the Phase 1 Improvements Cumulative Effects analysis to identify reasonable and foreseeable projects that could affect untolled alternate routes.

4. What has changed in the affected environment since 2006?

Distribution of Environmental Justice Populations

The 2006 FEIS reported minority population data at the block level and used multiple indicators, such as average rent, to extrapolate poverty data at the block level. Today, the U.S. Census Bureau estimates minority and poverty data at the block group level. As such, it is not possible to use the data reported in the 2006 FEIS environmental justice analysis to compare the current (2018) conditions with conditions in 2006. For this 2018 analysis, WSDOT used census block group-level data from the U.S. Decennial Census in 2000 to show demographic conditions in 2006.

The U.S. Census Bureau also made some changes in how they collect and report data since 2006, which means that, in many cases, this analysis is comparing actual data to estimates. For example, the minority data from the 2000 U.S. Decennial Census are actual data collected from each person living in the census block group at the time of the census. Minority data from the 2015 ACS are estimates based on five-year averages generated from surveys of a sample of residents living in the census block group from 2011 to 2015. Although ACS data are estimates, for the purpose of this analysis, the estimates are more useful than using 2010 Census data alone, because 2010 Census data is almost 10 years old (it was collected in 2009). Attachment A includes 2010 Census data. Footnotes under the demographic tables indicate sources and whether the percentages reflect actual data or estimates.

Table 2 compares demographic conditions in 2006 to the present. WSDOT's analysis shows that, since the November 2006 FEIS was published, the percentage of individuals identifying as a minority has increased from nearly 13 percent to just over 17 percent. The percentage of households with incomes at or below the federal poverty level increased slightly in the study area from about 9 percent to over 10 percent.

Note that the U.S. Census Bureau reset many census block groups between the 2000 and 2010 Census. As such, seven block groups no longer exist, and there are 14 new census block groups that did not exist in 2006. The shaded cells in Table 2 are those for which there are no data because the block group did not exist for that time period. Figure 5 shows the census tracts and block groups in 2000 and Figure 6 shows the census tracts and block groups in 2010.

Table 2. Comparison of Minority and Low-Income Populations in the SR 167 Phase 1 Improvements Study Area

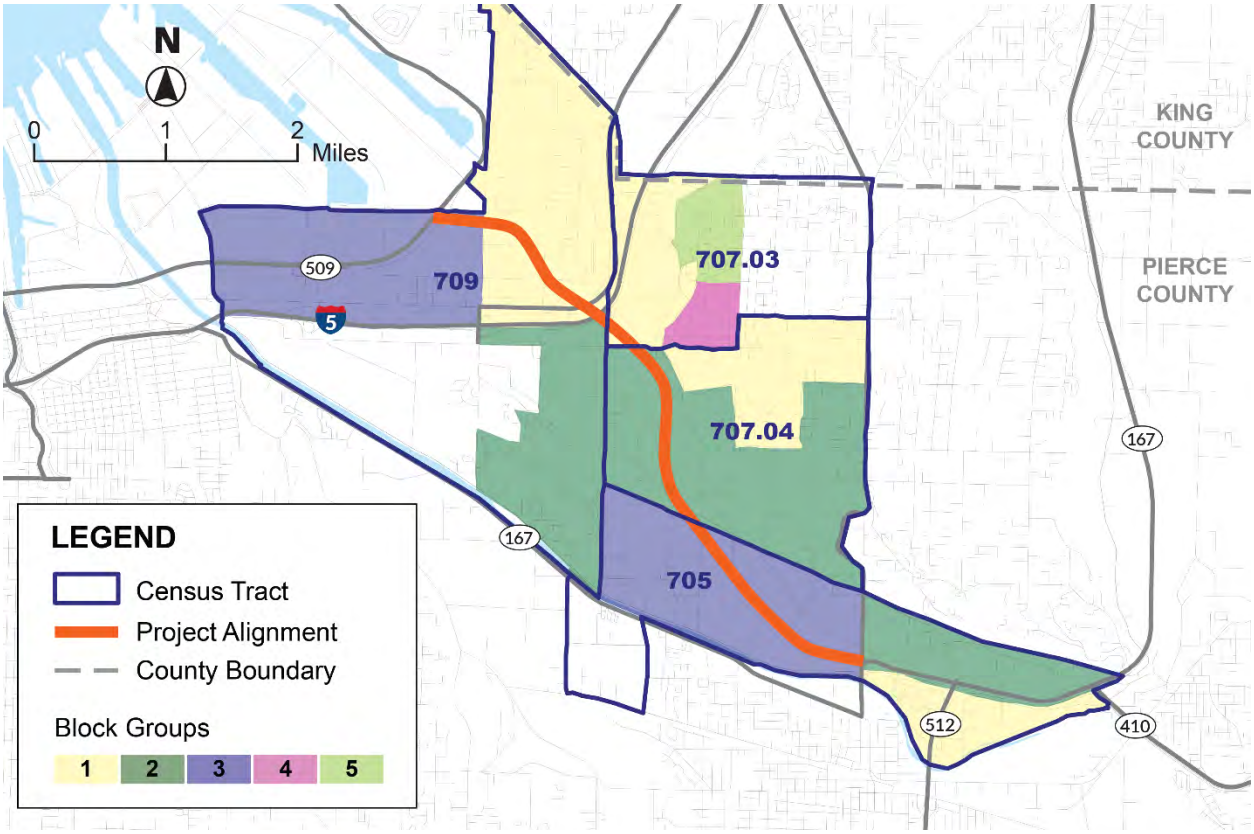
Census Tract	Block Group	Percent Identifying as Minority		Percent of Households at or Below Poverty Level	
		2006[a]	2018 [b]	2006[c,d]	2018 [e]
705	1	4.20%		7.20%	
705	2	8.26%		6.67%	
705	3	12.93%		8.26%	
707.03	1	8.52%	14.38%	10.07%	4.51%
707.03	4	6.16%	8.10%	11.85%	0.78%
707.03	5	6.92%	25.79%	6.93%	12.10%
707.04	1	5.45%		6.18%	
707.04	2	8.0%		7.59%	
709	1	13.16%		6.67%	
709	2	22.0%		9.62%	
709	3	43.27%		18.35%	
734.07	1		19.24%		5.96%
734.07	2		9.36%		8.63%
734.07	3		14.67%		17.60%
734.08	1		14.02%		10.89%
9400.02	1		12.39%		7.66%
9400.02	2		54.21%		19.18%
9400.02	3		36.07%		12.36%
9400.03	2		42.64%		11.31%
9400.03	3		35.52%		16.38%
9400.09	1		12.73%		6.51%
9400.09	2		9.07%		0%
9400.10	1		19.23%		13.50%
9400.10	2		6.90%		8.46%
Average for Study Area		12.63%	20.89%	9.04%	9.74%

[a] Source: U.S. Census Bureau *Census 2000* (2001)
[b] Source: U.S. Census Bureau *2011-2015 American Community Survey 5-Year Estimates* (2016)
[c] Source: U.S. Census Bureau *Census 2000* (2001) (estimated)
[d] In 2000, the U.S. Census did not report poverty status. To calculate poverty status, the analyst added the number of households with incomes at or below the 2000 U.S. Department of Health and Human Services poverty guidelines for the 48 contiguous states and D.C., which was $19,950 for a household of five individuals.
[e] Source: United States Census Bureau *2011-2015 American Community Survey 5-Year Estimates* (2016)

Figures 7 and 8 show the current distribution of minority and low-income populations in the SR 167 Phase 1 Improvements study area. The red line on each map shows the alignment of the Phase 1

402 improvements. The yellow-shaded portion of each map is the geographic area within ½ mile of the
403 project alignment.

404 Figure 5. Census Tracts and Block Groups (2000)



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406 Figure 6. Census Tracts and Block Groups 2010

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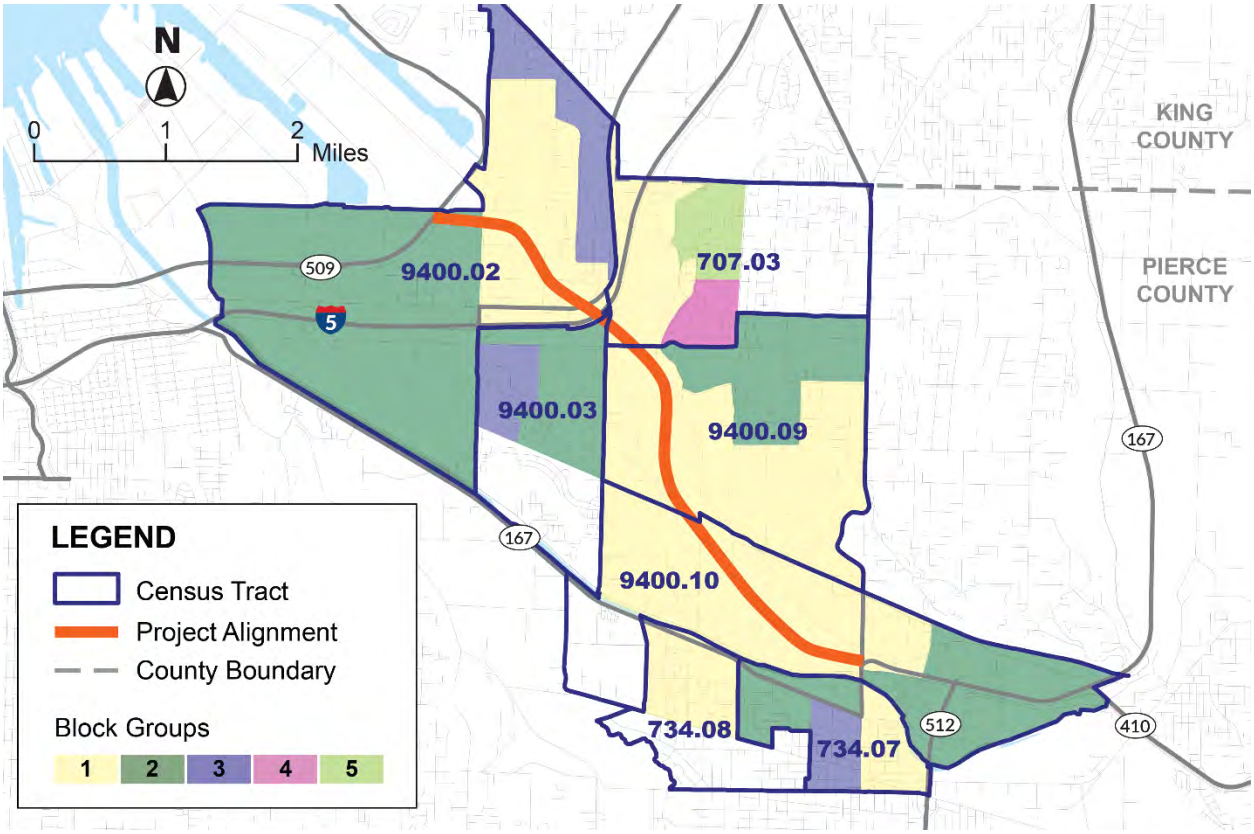

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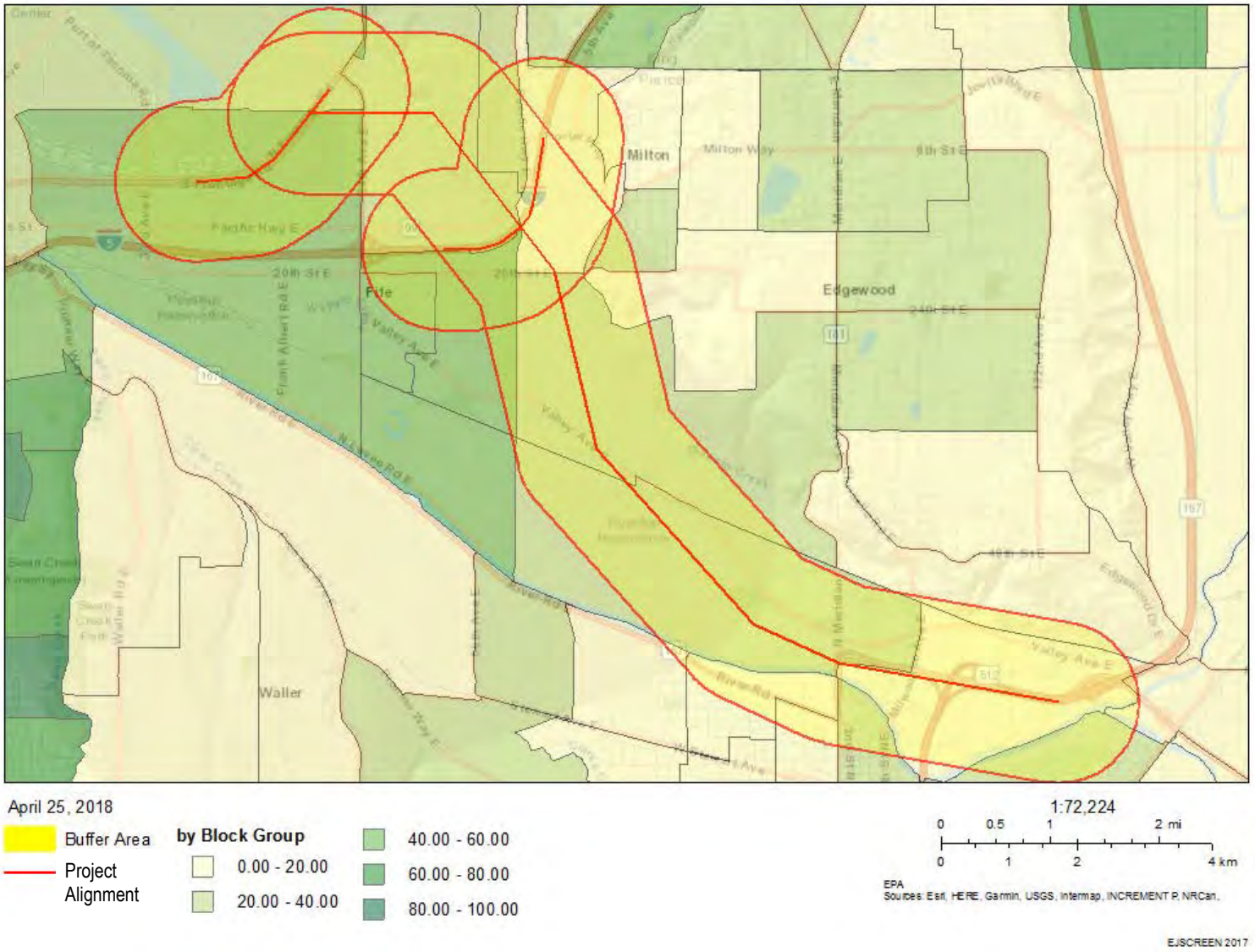
409 Figure 7. Percent Minority in the SR 167 Phase 1 Improvements Study Area



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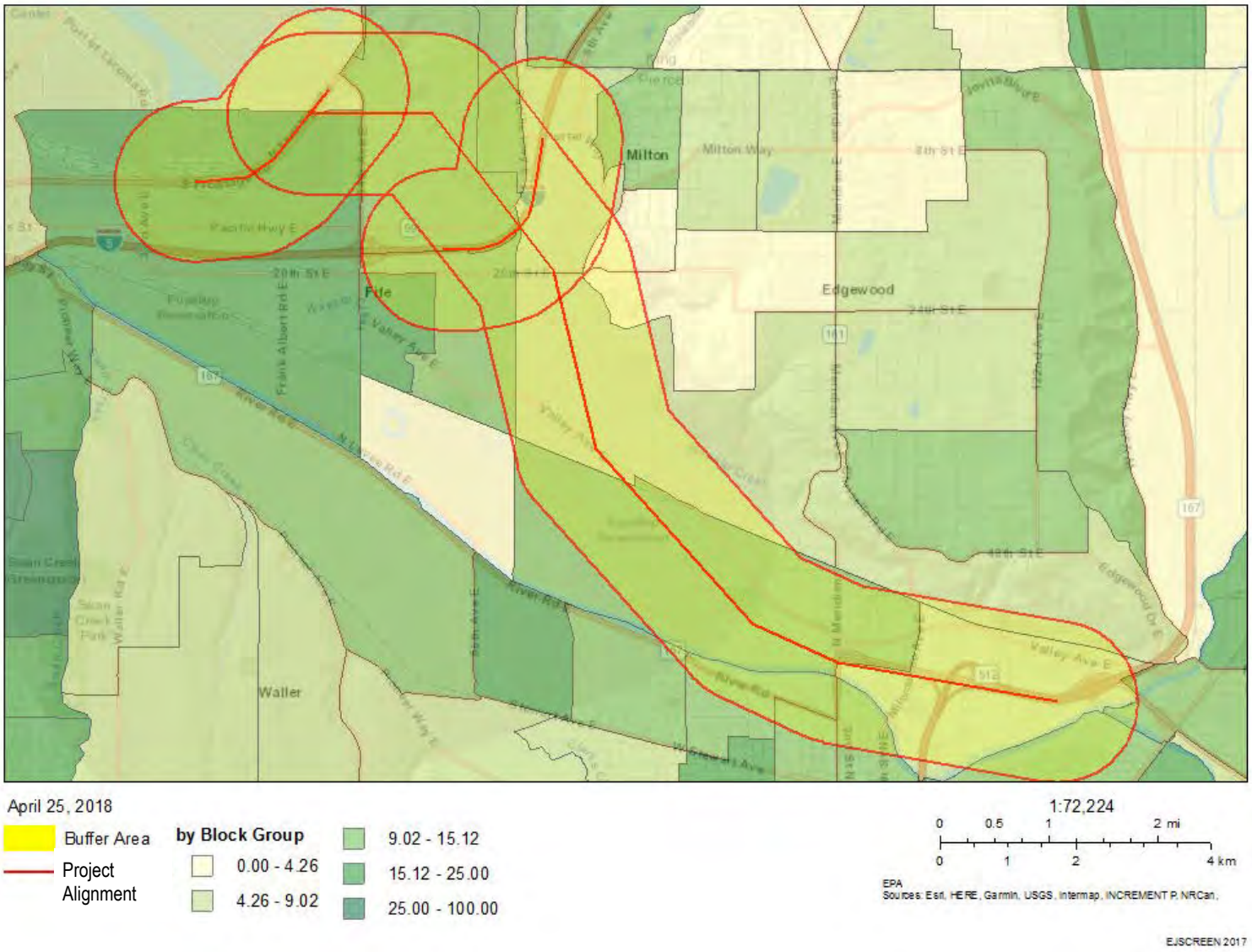
411 Figure 8. Percent Low-Income in the SR 167 Phase 1 Improvements Study Area



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WSDOT compared the data from the U.S. Census and American Community Survey with data from the Washington Office of Superintendent of Public Instruction (OSPI), which collects and archives demographic information from all public schools in the state. Table 3 compares conditions in 2006 to the present in each of the seven elementary schools in the SR 167 Phase 1 Improvements study area. It shows the percentage of students identifying as a minority and the percentage of students eligible for free- and reduced-price lunches, which is a proxy for low-income status during the 2005-06 and 2016-17 school years.

These data show even more dramatic shifts in demographics than the census data. The percent of students identifying as minority for all elementary schools in the study area grew from just over 22 percent in 2006 to just over 47 percent in 2017. The percent of students eligible for free- and reduced-price lunch grew from nearly 24 percent to just over 44 percent.

Table 3. Comparison of Data for Students Enrolled in Public Elementary Schools in the SR 167 Phase 1 Improvements Study Area

Elementary School	**Percent of Students Identifying as Minority**		**Percent of Students Eligible for Free- and Reduced-Price Lunch**	
	2005-06	2016-17	2005-06	2016-17
Northeast Tacoma	34.0%	57.7%	34.6%	46.8%
Northwood	18.0%	47.8%	18.4%	31.1%
Mountain View	8.0%	32.0%	19.2%	40.2%
Stewart	29.2%	47.8%	23.0%	55.6%
Karshner	21.9%	57.4%	19.1%	51.0%
Waller Road	15.1%	40.8%	13.4%	49.6%
Hedden	28.9%	46.4%	36.7%	35.2%
Average for all elementary schools in study area	22.2%	47.1%	23.5%	44.2%

Source: Washington Office of Superintendent of Public Instruction, 2005-06 and 2016-17 school years

Figure 9 shows the locations of the elementary schools. While some elementary schools are located outside the SR 167 Phase 1 Improvements study area, they draw students from within the study area.

Consideration of Limited English Proficient Populations

A limited-English proficient person is an individual who has difficulty speaking, reading, writing, or understanding the English language and whose difficulties may deny that individual the opportunity to meaningfully engage in the transportation decision-making process. This definition applies to an individual who:

Was not born in the United States;

Speaks a native language other than English and comes from an environment where a language other than English is dominant; or

Comes from an environment where a language other than English has had a substantial effect on that individual's English-language proficiency.

Figure 9. Elementary Schools in the SR 167 Phase 1 Improvements Study Area

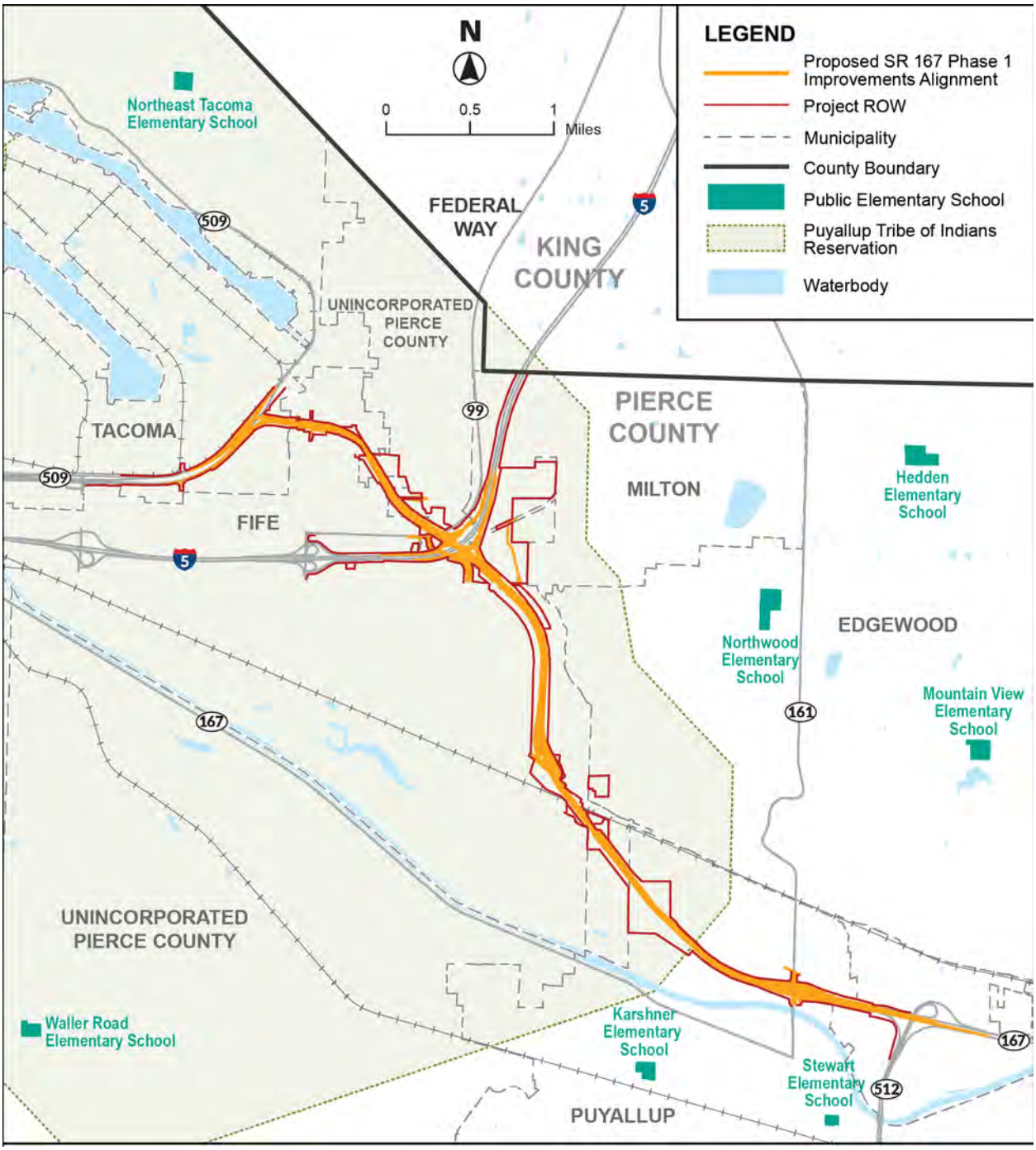

Table 4 shows the percentages of limited English proficient households in the study area. In the study area as a whole, only 2.5 percent of households are limited English proficient, which is relatively small for the region. That said, there are three census block groups where the percentage of limited English proficient households is higher than 5 percent.

Table 4. Percentage of Limited English Speaking Households in the SR 167 Phase 1 Improvements Study Area		
Census Tract	**Block Group**	**2018 Analysis**
707.03	5	0%
707.04	2	0%
709	1	0%
734.07	3	0%
734.08	1	0%
9400.02	1	0%
9400.02	2	2.05%
9400.02	3	8.60%
9400.03	2	2.95%
9400.03	3	5.61%
9400.09	1	5.05%
9400.09	2	7.42%
9400.10	1	1.23%
9400.10	2	0%
Average for Study Area		2.5%

Source: American Community Survey Five-Year Estimates, 2011-2015 (estimated). Note that limited English proficiency was not evaluated in 2006.

WSDOT confirmed limited English proficient populations with 2005-06 and 2016–2017 transitional and bilingual data available from OSPI. Table 5 compares the percentage of transitional or bilingual students in study area schools in 2006 with the present.

Figure 10 shows the distribution of linguistically isolated households in the study area. Linguistically isolated households is a U.S. Census term that refers to households where no member over 14 years old reports speaking English "very well." (U.S. Census Bureau, https://factfinder.census.gov/help/en/linguistic_isolation.htm)

The EJ Screen tool indicates there are 78 linguistically isolated households in the study area (EJ Screen, 2017). The majority of linguistically isolated households in the study area speak an Asian language at home; Spanish-speaking linguistically isolated households are less common in the study area. If demographic data indicates 5 percent of the population or more than 1,000 persons within 1/2 mile of the project speak English less than well, WSDOT must provide equal access to project information in their language (WSDOT, 2017). According to the demographic data, fewer than 1,000 people and only 2.5% of the study area speak English less than well, indicating that translation is not required in the SR 167 Phase 1 Improvements study area.

On the other hand, of the households that are anticipated to be displaced by the Phase 1 Improvements project, some are linguistically isolated and Spanish speaking. WSDOT is providing translated documents and Spanish-language interpreters to the affected households; the mitigation section of this discipline report provides more detail. WSDOT would also provide translation and interpretation services to other affected community members upon request.

Table 5. Percentage of Transitional or Bilingual Students in the SR 167 Phase 1 Improvements Study Area Schools		
School Name	**Percentage of Transitional or Bilingual Students**	
	2005-06	**2016-17**
Northeast Tacoma	6.2%	20.0%
Northwood	1.7%	11.0%
Mountain View	2.2%	5.2%
Stewart	3.9%	7.1%
Karshner	10.9%	21.4%
Waller Road	2.6%	6.8%
Hedden	10.9%	9.8%
Average for all elementary schools in study area	5.5%	11.6%

Source: Washington Office of Superintendent of Public Instruction, 2005-06 and 2016-17.

Environmental Justice Populations Who May Be Potential Users of Tolled SR 167 Phase 1 Improvements

With the addition of tolling for the Phase 1 Improvements, WSDOT also has to consider whether environmental justice populations would be users of the new SR 167 Phase 1 Improvements. This section provides a demographic analysis of the SR 167 travelshed (the geographic area from which SR 167 users are expected to originate).

Figure 11 shows the percent of residents in each census block group in the SR 167 travelshed who identify as minority. Figure 12 shows the percent of households in each census block group in the SR 167 travelshed with incomes at or below the federal poverty level. Figure 13 shows the percent of households in each census block group in the SR 167 travelshed who are linguistically isolated.

To determine whether WSDOT should translate materials that will be distributed to the public about tolling into other languages, WSDOT conducted a demographic analysis of language groups in the SR 167 Phase 1 Improvements travelshed. WSDOT found a number of census block groups where 5 percent or more of the population is linguistically isolated and speaks Spanish at home. WSDOT also found a number of census block groups where 5 percent or more of the population is linguistically isolated and speaks an Asian or Pacific Islander language at home. The census groups Asian and Pacific Islander languages into one category, so it is more difficult to determine if 5 percent or more of the population of a block group speaks Chinese, Vietnamese, Cambodian, or another Asian language. These data, coupled with feedback from interviews with social service providers, indicate WSDOT should translate toll-related information into Samoan (considered a Pacific Islander language), Cambodian, Chinese, and Vietnamese, in addition to Spanish.

Figure 14 shows the percent of individuals in each census block group in the SR 167 Phase 1 Improvements travelshed who are both linguistically isolated and speak Spanish at home. Figure 15 shows the percent of individuals in each census block group in the travelshed who are both linguistically isolated and speak an Asian or Pacific Islander language at home.

484 Figure 10. Percent Linguistically Isolated in the SR 167 Phase 1 Improvements Study Area

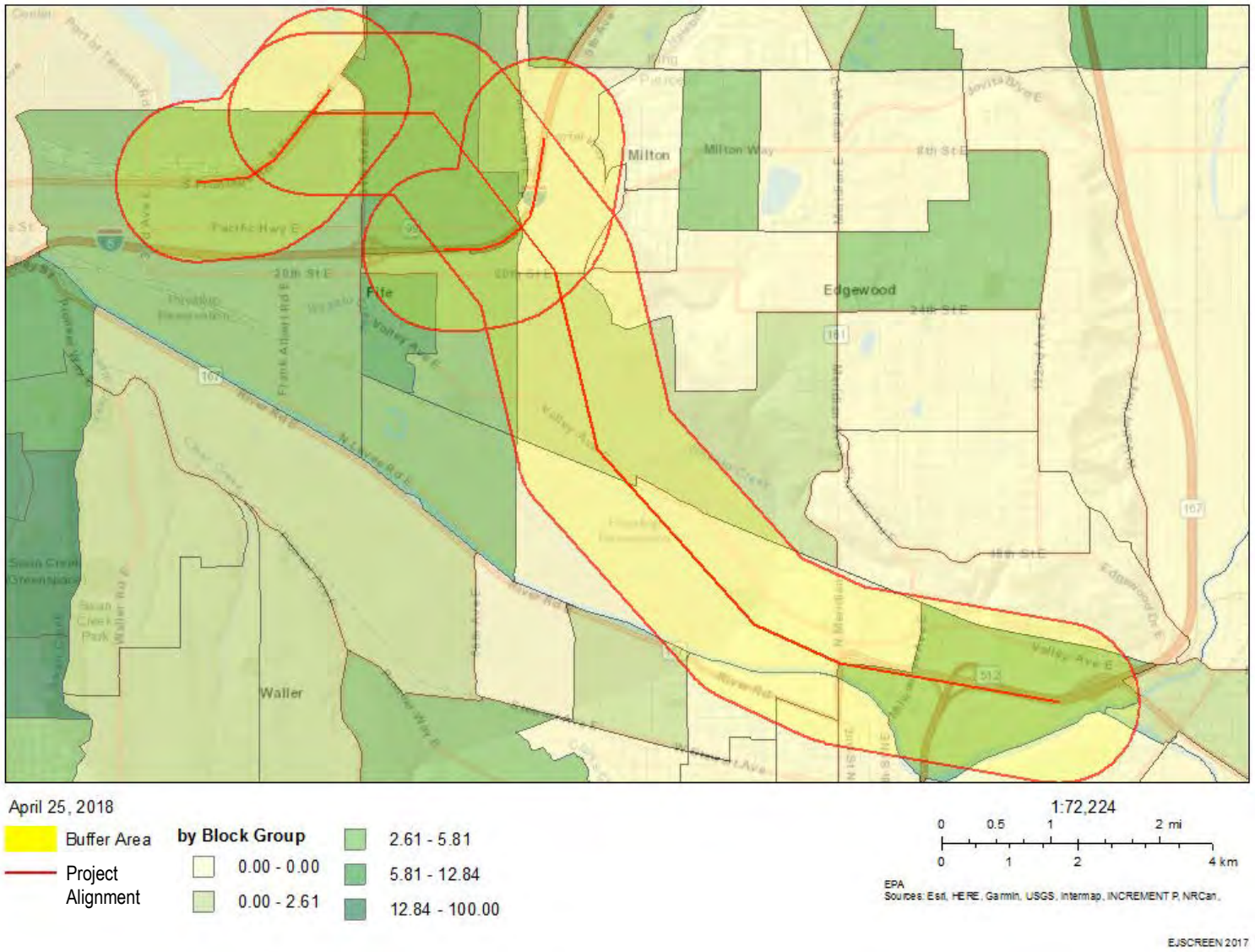

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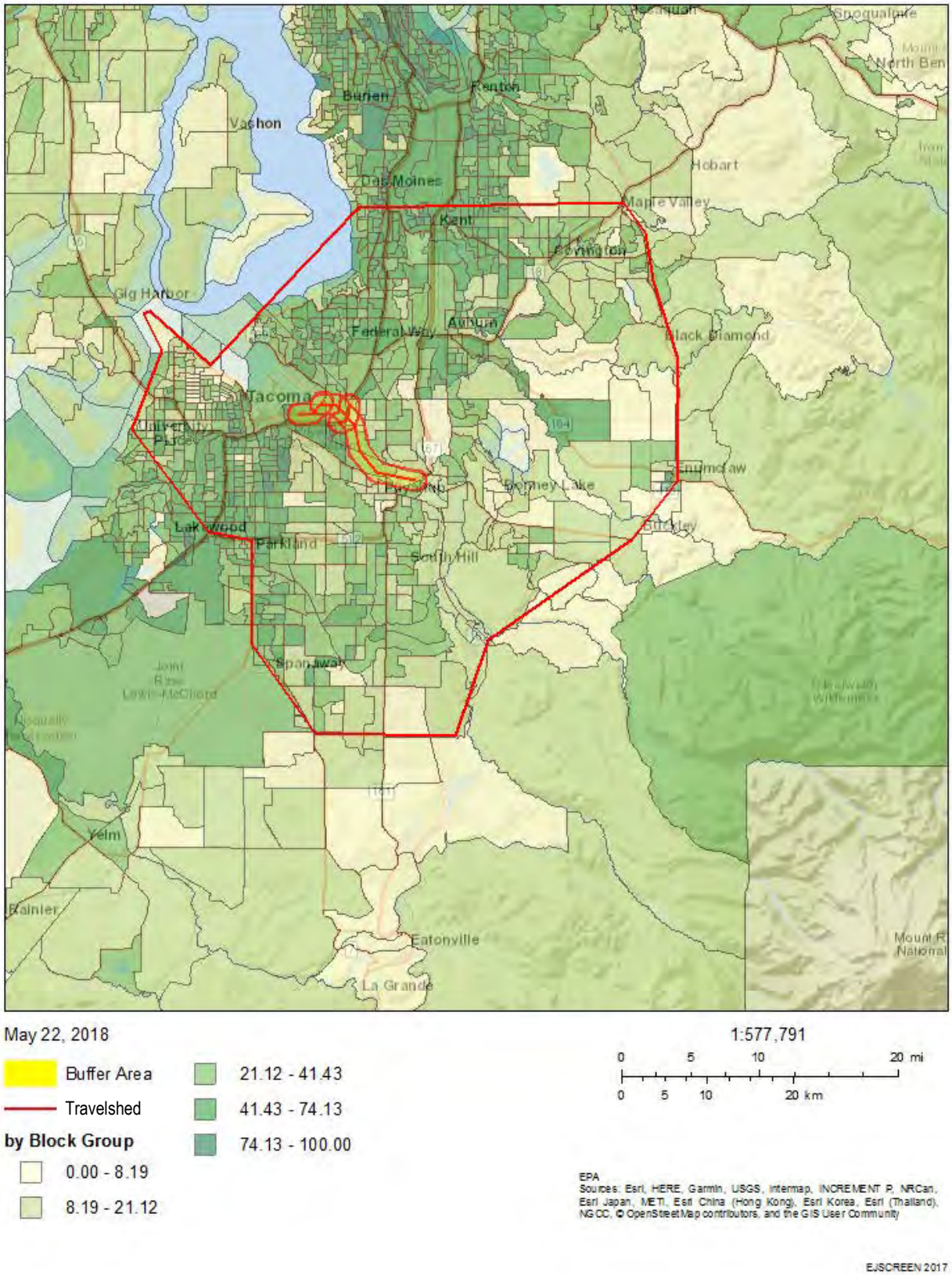
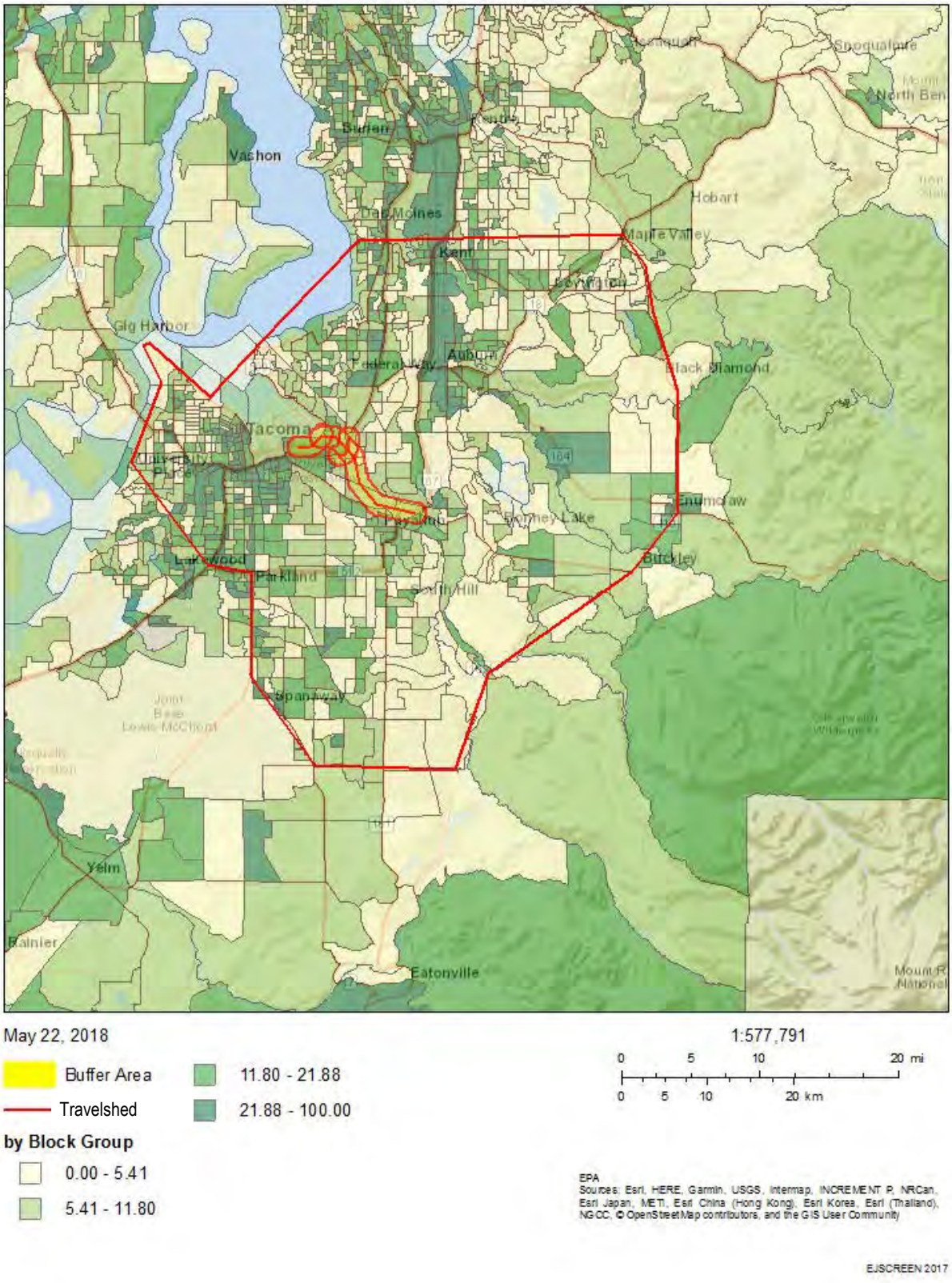
Figure 11. Percent Minority in the SR 167 Phase 1 Improvements Travelshed



488 Figure 12. Percent Low-Income in the SR 167 Phase 1 Improvements Travelshed



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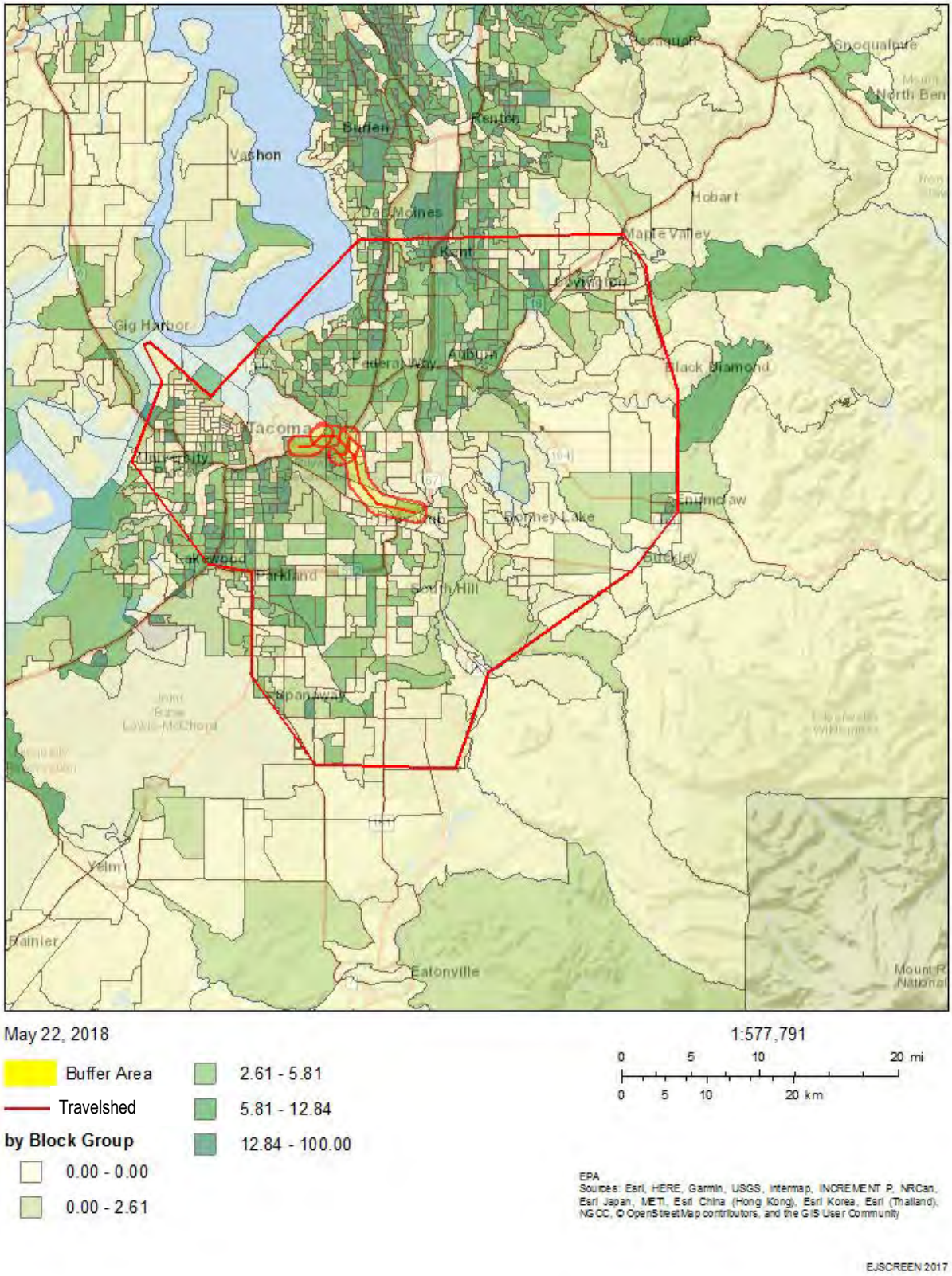
491 Figure 13. Percent Linguistically Isolated in the SR 167 Phase 1 Improvements Travelshed



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493 Figure 14. Percent of Households who are Linguistically-Isolated and Speak Spanish at Home

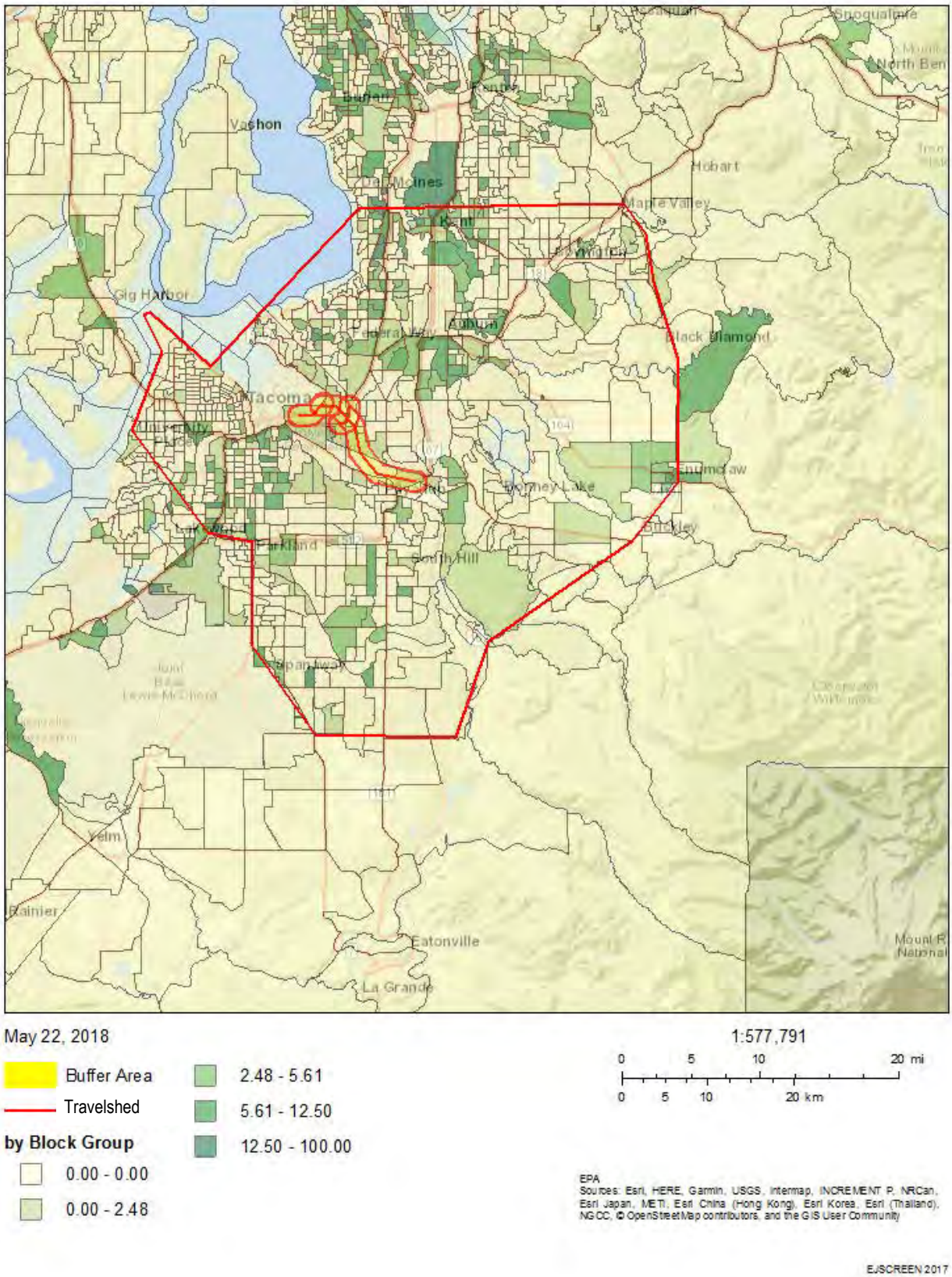

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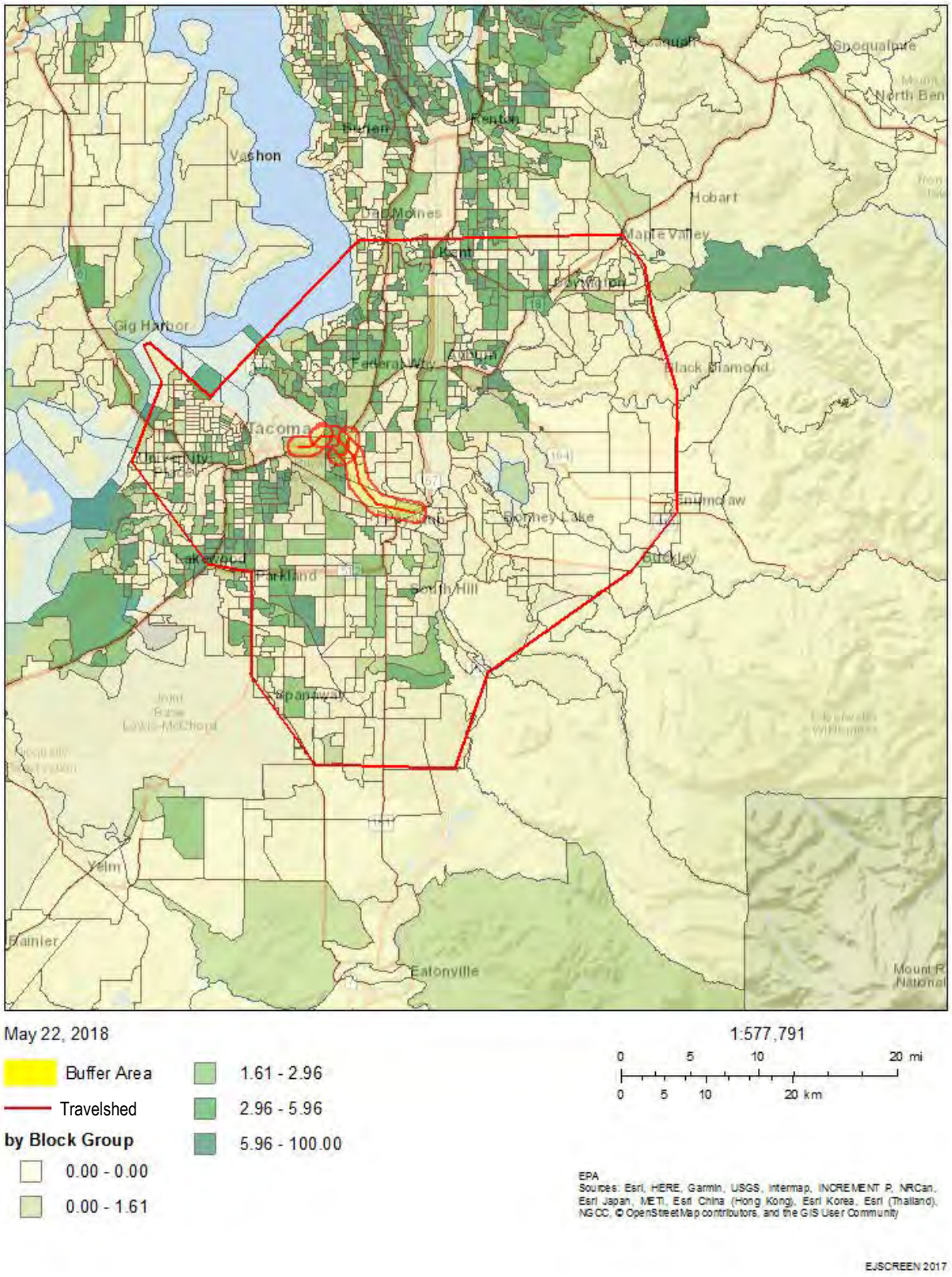
Figure 15. Percent of Households who are Linguistically-Isolated and Speak Asian or Pacific Islander Language at Home



5. How would permanent project effects (beneficial and/or adverse) compare to the 2006 FEIS Build Alternative?

Based on WSDOT's analysis, described in detail below, tolling of the Phase 1 Improvements would not have disproportionately high and adverse effects on low-income populations.

Potential Benefits to All Users, Including Environmental Justice Populations

Travel through the study area will generally improve with the SR 167 Phase 1 Improvements project. The project will provide motorists with the option to pay the toll and use the new facility, and receive a faster, more reliable trip. Most trips on existing routes in the project area will be the same or faster than without the project. Most intersections in the project area will improve with the project.

Potential Effects of Tolling on Environmental Justice Populations

When the Washington State Legislature funded the SR 167 Phase 1 Improvements, they intended for the improvements to be fully tolled. The 2006 FEIS Build Alternative did not include tolling of the new facility, so the 2006 FEIS did not analyze or identify environmental justice benefits or effects related to tolling. This section describes WSDOT's analysis of the potential effects of the proposed new tolling on low-income, minority, and limited English proficient individuals.

A 2009 research report conducted by the University of Washington and funded by WSDOT recommended asking the following questions to determine whether a specific toll will have a disproportionately high and adverse effect on certain populations (Plotnick et al., 2009):

1. How would different households use the transportation facilities after a toll is imposed?
2. How would tolls affect the economic status of low-income and non-low-income households, on average?
3. How would travel times improve for residents who choose tolled routes and worsen for those who do not?
4. How would the potential travel behavior changes differ by income status?

Based on the analysis, WSDOT concludes the toll would not have a disproportionately high and adverse impact on low-income, minority, and/or limited English proficient users. The University of Washington report concluded that most low-income residents in the Puget Sound region would not be adversely affected by tolling as long as there were accessible and convenient alternatives to paying the toll (Plotnick et al., 2009). Untolled routes would remain accessible and convenient alternatives to the new tolled SR 167 Phase 1 Improvements and WSDOT anticipates they will offer close to the same or slightly improved travel times for motorists compared to the No Build conditions. As such, tolls would not have a disproportionately high and adverse effect on low-income or limited English proficient residents who travel in the study area.

The following sections explain WSDOT's analysis.

How would different households use the transportation facilities after a toll is imposed?

A key assumption of tolling for the Phase 1 Improvements is that no new tolls would be charged on existing facilities. As such, tolls on the proposed new facility are unlikely to affect most people using existing SR 167 facility, which runs from Puyallup to Renton. This includes low-income, minority, and limited English proficient individuals who currently use SR 167. (Note that SR 167 from Puyallup to Renton includes an existing tolled facility. There are High Occupancy Toll (HOT) Lanes, in which two-

person carpools may travel free of charge and single-occupant motorists may choose to pay a toll to use the lanes.)

Currently, all potential future users of the new SR 167 Phase 1 Improvements—low-income and non-low-income—use I-5 and local arterials/streets in the vicinity to travel in the study area. When the Phase 1 Improvements are operational, traffic analysts forecast that some people who are currently using I-5 and arterials would change to using the new tolled SR 167 Phase 1 Improvements.

The transportation analysis for this 2018 Re-evaluation assumes toll rates are $0.75 to $3.00 per trip during peak travel periods, although the Washington State Transportation Commission (WSTC) will decide actual toll rates for the facility in the future.

Table 6 compares average weekday peak period toll rates for passenger vehicles on other tolled facilities in the region. The table shows the currently projected toll rates for the SR 167 Phase 1 Improvements are relatively low compared to other tolled facilities in the region.

Table 6. Comparison of Weekday Peak Period Toll Rates for Passenger Vehicles on Tolled Facilities in the Region

Tolled Facility	***Good to Go!* Pass**	**Pay by Mail**
Phase 1 Improvements	$0.75 -$3.00	$2.75 - $5.00
SR 520	$3.40 - $4.30 each trip	$5.40 - $6.30 each trip
Tacoma Narrows Bridge	$6	$7
SR 167 HOT Lanes	$0.50 - $9	n/a
I-405 Express Toll Lanes	$0.75 - $10	$2.75 - $12

Source: www.wsdot.wa.gov/Tolling/TollRates.htm. Date accessed: May 22, 2018

If the WSTC sets toll rates at $0.75, WSDOT anticipates there would not be a substantial income difference between people who choose to use the new facility and people who use untolled alternatives. Evidence from other facilities with similarly priced tolls support this assumption.

For example, in 2009 WSDOT conducted a survey of existing SR 167 high-occupant toll (HOT) lane users and found HOT lane users spanned all income categories, including households with relatively low incomes. At the time, HOT lanes cost an average of $1 per trip. The survey showed that the majority of SR 167 HOT lane users had annual household incomes of $50,000 to $124,000, and nearly 16 percent of users had household incomes under $50,000 (WSDOT, 2009). Studies of SR 91 express lanes in California indicate about three-quarters of vehicles using the express lanes at any given time belong to low- and middle-income users (FHWA, 2017).

On the other hand, outcomes from WSDOT's interviews with community-based organizations and social service providers in 2017 suggest there may be some differences among income groups on how they use the new tolled Phase 1 Improvements facility. In general, interview participants expressed concern that a toll would dissuade low-income individuals from using the new SR 167 facility. Several interview participants explained some of their clients cannot afford gas for their automobiles and expressed skepticism that these low-income clients would be able to afford a toll.

Tolling could affect the extent to which individuals with limited English proficiency use the new Phase 1 Improvements facility. The electronic toll system could disproportionately affect limited English proficient users who have difficulty understanding the toll system. Limited English proficient residents who do not understand the system could accumulate significant collection debt if they use it. A $0.75 trip for someone who is English proficient and understands the system can quickly grow to $40 for someone who doesn't, when WSDOT adds the toll surcharge plus late fees for those individuals who do not pay their bill on time.

All-electronic tolling could disproportionately affect individuals who do not have debit, credit card, or EBT accounts; do not have enough funds to start an electronic toll account; or do not have Internet access. Many of these individuals are low-income and/or limited English proficient. Individuals would be able to open an account in person using cash at one of three customer service centers located in Seattle, Bellevue, or Gig Harbor. Some customers may have difficulty getting to one of these customer service centers. The WSDOT Toll Division has a first-time penalty forgiveness program, which may help for those new to tolling. Residents can also receive language support by calling the "*Good to Go!*" call center.

How would tolls affect the economic status of low-income and non-low-income households on average?

Any toll—even relatively low-cost tolls—disproportionately affects low-income households. Compared to households with moderate and high incomes, the toll would represent a higher proportion of annual income.

For a daily user, WSDOT estimated the annual cost for traveling on the new facility 5 days a week, 2 times a weekday, 48 weeks of the year to be approximately $360 to $1,440.

For users of the Phase 1 Improvements who do not have a *Good to Go!* pass, the costs would be higher. WSDOT would charge a $2 surcharge on each trip for customers who pay by mail, instead of using a *Good to Go!* pass. The surcharge would disproportionately affect low-income users.

These surcharges could add up very quickly for a regular user of the tolled facility. For example, if someone uses the new SR 167 Phase 1 Improvements facility just twice a week for 48 weeks a year and pays by mail, their annual cost would be $264 to $480. For a daily user who pays by mail, their annual cost would be $1,320 to $2,400, which would represent 5 to 10 percent of a low-income household's annual income compared to 2 to 3.5 percent for higher-income users.

Table 7 shows the percentage of annual household income the toll represents for low, middle, and high-income motorists who use the tolled facility twice a weekday for 48 weeks a year. The table compares costs for customers with and without a *Good to Go!* pass.

Table 7. Comparison of Percentage of Household Income for Different User Types

User Type	**Low-Income User**	**Middle-Income User**	**High-Income User**
Description of user type	$28,780/year or less (Health and Human Services federal poverty level of household of 5 individuals)	Median household income for Pierce County: $61,468/year	1.5 x median household income for Pierce County ($92,229/year or more)
Customer with *Good to Go!* Pass	1.25% to 1.67%	<1%	<1%
Pay by Mail customer	4.6% to 8.3%	2.2% to 3.9%	1.4% to 2.6%

While a few hundred dollars a year may not seem like a lot to a moderate or high-income household, it can be cost-prohibitive for a low-income household. This is especially true in light of rising housing costs in the Puget Sound region. Rapid population and job growth in the region over the past decade has increased demand for housing, thus driving up purchase prices and rents. A May 2017 article by the Seattle Times reports home prices in the Puget Sound region have been rising faster than any other metro region in the country. Rents have also been increasing, rising 57 percent in the last six years (Seattle Times, May 2017). According to the U.S. Department of Housing and Urban Development (HUD), households spending more than 30 percent of income for housing costs are "cost-burdened" and may have difficulty affording necessities such as food, clothing, transportation, and medical care. Households spending more than 50 percent are "severely cost-burdened" (HUD, 2017). According to the

Washington Department of Commerce Affordable Housing Advisory Board 2015 Housing Needs Assessment, there are nearly 23,000 low-income households in Pierce County who are cost-burdened, and most of those households are severely cost burdened. (WA Department of Commerce, 2015) When households are cost-burdened, it makes it that much harder for them to pay for other needs, such as transportation. Given the level of cost burden that households in Pierce County are experiencing, it is likely many of those households will be not able to derive the benefits of paying a toll to use the new SR 167 Phase 1 Improvements facility.

How would travel times improve for residents who choose tolled routes and change for those who do not?

A key benefit of the Phase 1 Improvements is all users—including low-income, minority, and/or limited English proficient users—would have a new travel option in the study area. For those motorists who cannot afford or choose not to pay the toll, I-5 and local arterials will continue to provide an untolled option. Travel times on these existing routes will improve or stay the same for most trips.

To understand the extent to which a toll adversely affects low-income and/or limited English proficient individuals, WSDOT compared travel times for motorists who use tolled and untolled routes to travel in the study area. Table 8 shows the travel times for peak travel periods, according to the WSDOT Transportation Discipline Report for NEPA Re-Evaluation of Phase 1, SR 167 Completion Project (2018). Note that the travel forecast models assumed a $0.75 toll on the Phase 1 SR 167 facility. As such, if the WSTC sets a higher toll and that toll discourages some motorists from using the tolled facility, the travel times for the tolled facility are likely to be faster than estimated and the travel times for untolled routes are likely to be slower than estimated.

The table shows that, while there will be some travel time benefit for using the new tolled route, the travel time difference between most tolled and untolled routes is typically around six minutes. For most routes, motorists who pay the toll will save a maximum of eight minutes. The only route where there is substantial time difference between tolled and untolled routes is Port of Tacoma to SR 18, where the tolled route takes half the time as the untolled route during the afternoon peak period (WSDOT, 2018).

Table 8 also shows the project will benefit motorists who use untolled routes. For most trips, travel times will be the same or better with the project than without, up to 11 minutes. Figure 16 shows the proposed SR 167 facility and alternative untolled routes. As such, the project would benefit all users, including low-income and/or limited English proficient motorists who use untolled routes.

Are the effects described above disproportionately high and adverse?

The cost of the tolls, especially in the context of rising costs for low-income households in Pierce County in addition to the all-electronic toll collection system, would disproportionately affect low-income motorists and could disproportionately affect limited English proficient motorists. However, because alternate routes would remain accessible and convenient alternatives that would, for most routes and times, offer nearly the same or slightly faster travel speeds than under No Build conditions, WSDOT concluded the tolls would not have a disproportionately high and adverse effect on low-income and limited English proficient motorists.

Table 8. Comparison of Average Travel Times in Minutes for Tolled and Untolled Routes in the SR 167 Phase 1 Improvements Project Area (2045)

Timing	Route	Direction[a]	Current Route (Un-tolled)		SR 167 Phase 1 Build Route (Tolled)	Travel Time Difference between Tolled and Untolled Routes
			No Build	SR 167 Phase 1 Build		
Morning Peak (6 am to 9 am, weekdays)	Puyallup to north of SR 18	NB	22	21	15	6
		SB	18	19	11	8
	Port of Tacoma to Sumner	EB	25	24	19	5
		WB	24	22	17	5
	Port of Tacoma to SR 18	NB	18	20	16	4
		SB	14	16	13	3
	Port of Tacoma to Puyallup	EB	20	18	15	3
		WB	27	21	15	6
Afternoon Peak (3 p.m. to 6 p.m., weekdays)	Puyallup to north of SR 18	NB	18	18	12	6
		SB	22	21	15	6
	Port of Tacoma to Sumner	EB	26	25	17	8
		WB	37	28	22	6
	Port of Tacoma to SR 18	NB	17	19	9	10
		SB	34	24	10	14
	Port of Tacoma to Puyallup	EB	24	20	15	5
		WB	29	24	18	6

Source: WSDOT Transportation Discipline Report for NEPA Re-Evaluation of Phase 1, SR 167 Completion Project (2018)

[a] NB = northbound, SB = southbound, EB = eastbound, WB = westbound

652 Figure 16. Proposed SR 167 Extension and Alternate Routes



653

654 Other Effects to Environmental Justice Populations

655 Table 9 compares adverse permanent impacts of the new proposed Phase 1 Improvements with the
656 2006 FEIS Build Alternative. WSDOT did not find any other impacts that would disproportionately affect
657 environmental justice populations.

Table 9. Comparison Summary of Impacts: 2006 FEIS Build Alternative and Phase 1 Improvements	
Noise – 2006 Build Alternative	**Phase 1 Improvements**
Under the Build Alternative, noise levels were predicted to increase in the SR 167 study area from 2 to 18 decibels (dBA). The greatest increase in noise levels under the Build Alternative will be near the Puyallup Recreation Center along the portion of the Valley Road approaching North Meridian. Additional modeling indicated noise will remain below FHWA criteria where people are likely to congregate. Noise levels at 45 out of 60 sites will approach or exceed the FHWA criteria under the Build Alternative in 2030.	Phase 1 would result in one new effect compared to the 2006 FEIS. There is one key difference since the 2006 FEIS in the affected environment. The Fife Heights residences were not built at the time of the 2006 FEIS, so WSDOT did not evaluate that area for noise impacts. For the Phase 1 Improvements evaluation, WSDOT predicts noise levels will exceed FHWA criteria for abatement. Phase 1 Improvements would not result in any other new or significant noise impacts. Fewer residences would approach or exceed FWHA noise abatement criteria compared to the 2006 FEIS Build Alternative due to the smaller project footprint and lower predicted traffic volumes.
Displacements of Residents – 2006 Build Alternative	**Phase 1 Improvements**
Under the Build Alternative, WSDOT will displace 83 single-family residential units, 12 multi-family apartment units, and 17 manufactured home units. The majority of anticipated displacements will occur within the Fife city limits. The residences are mostly older single-family residential units located in the North Fife area and in the vicinity of the I-5 interchange near 70th Avenue East. WSDOT already purchased several parcels between 2000 and 2006, prior to the Tier II FEIS. Since the Tier II FEIS was published in November 2006, WSDOT continued to acquire property for the project ROW. Since October 2017, WSDOT has purchased and relocated 58 single family homes	Phase 1 would not result in any new or significant impacts compared to the 2006 FEIS. Phase 1 improvements require slightly fewer residential acquisitions than the 2006 Build Alternative. Since most of those acquisitions have already taken place, Phase 1 would require only 43 more residential acquisitions – all single-family and manufactured homes. According to the WSDOT staff working on the relocations, there has been very little to no turnover in ownership amongst most of the homeowners affected by displacements. In other words, most are the same homeowners as when the 2006 FEIS was written. Of the 43 residential relocations, 17 relocations are at manufactured homes with tenants who are likely to be low income. Six families in residence are Hispanic. Some of these families are limited English proficient. The 2006 FEIS Environmental Justice Discipline Report disclosed these impacts to low income residents, so although some of the tenants of the Hylebos Creek Estates mobile home park may have changed since 2006, overall impacts to low income residents are not new to the 2018 analysis.
Community Cohesion – Build Alternative	**Phase 1 Improvements**
As described in the 2006 FEIS, displacements of residents, bisection of neighborhoods by the new highway structure, and the disruption of access to community facilities and services would adversely affect community cohesion. The 2006 FEIS concludes that adverse impacts on community cohesion will be low. It also concluded the completed project will have an overall positive effect on community cohesion because of improved movement of people and goods through the project area.	Phase 1 would not result in any new or significant impacts compared to the 2006 FEIS.

Table 9. Comparison Summary of Impacts: 2006 FEIS Build Alternative and Phase 1 Improvements	
Effects to businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations – 2006 Build Alternative	**Phase 1 Improvements**
Under the Build Alternative, WSDOT will acquire and displace 22 to 27 businesses, one public facility, and one farming operation. There are no public facilities (hospitals, schools, and police departments) located within the project corridor. The Build Alternative will not separate public services from the communities they serve. The Build Alternative will not affect school district service areas.	Phase 1 would not result in any new or significant impacts compared to the 2006 FEIS. The Phase 1 Improvements would result in the acquisition of fewer commercial properties and the relocation of 10 fewer businesses than estimated for the 2006 FEIS Build Alternative. All of the displaced businesses are small businesses with few employees, none of whom are environmental justice populations. There may be at least one displaced business owners who identifies as minority. The 2006 Environmental Justice Discipline Report disclosed these impacts. Phase 1 Improvements would not result in any new or significant impacts to public services, community facilities, or utilities beyond those discussed for the 2006 FEIS Build Alternative. No community facilities would be displaced as a result of Phase 1 Improvements. Changes in access are not expected to affect any public services. Once the construction of the Phase 1 Improvements is complete, emergency response times and access to community facilities are expected to improve because of the projects' effects on traffic congestion.
Parks and Recreational Resources – 2006 Build Alternative	**Phase 1 Improvements**
The Build Alternative will relocate Hylebos Creek from its current location, which is a degraded ditch adjacent to I-5 to a more natural meandering channel. To implement this improvement, the Build Alternative will affect two facilities—a recreational center and a trail. When the FEIS was published in 2006, the City of Fife planned to develop the Pacific National Soccer Park—a city-owned and operated soccer facility. The Build Alternative will require use of six of 18 of the planned soccer fields for this facility. The demographic analysis confirms there are environmental justice populations who live in Fife—54 percent identify as minority and 20 percent have incomes below the poverty level (2011-2015 ACS 5-Year Estimates) The Build Alternative will relocate the southern terminus of the Interurban Trail and affect access to the trail. The southern terminus of the Interurban Trail is along the border of Fife Heights and Milton, where the demographic analysis confirms the presence of environmental justice populations. Milton and Fife have lower proportions of minority residents than Pierce County as a whole, but 19 percent of Milton residents and 24 percent of Fife Heights identify as minority. Although only about 6 percent of Milton and Fife Heights residents have incomes below the poverty level, there are four census block groups near the pedestrian and bicycle improvements where 20 percent or more of individual have incomes below the poverty level—nearly double the poverty rate for King County and higher than the poverty rate for Pierce County. (2011-2015 ACS 5-Year Estimates)	Phase 1 would not result in any new or significant impacts compared to the 2006 FEIS. Phase 1 Improvements would enhance the Hylebos Nature Area. The Pacific National Soccer Park is no longer a planned facility, so Phase 1 would not affect it. Phase 1 will affect the Interurban Trail, similar to the Build Alternative, but it will also make several pedestrian and bicycle improvements in the vicinity of the interurban trail and intersection of 70th Avenue E and SR 99. This includes a new shared-use path on the 70th Avenue E overpass over SR 99 that will eventually connect with the Hylebos Wildlife Trail, improved pedestrian connections to the Interurban Trail, and a new Interurban Trail gateway parking lot. These improvements are in Milton and Fife Heights. As described earlier, the demographic analysis confirms there are environmental justice residents in these communities.

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6. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Mitigation for Effects of Tolling

WSDOT did not find that a toll would cause a disproportionately high and adverse effect to environmental justice populations requiring mitigation. Nonetheless, to minimize the disproportionate effects of the all-electronic toll system on limited English proficient populations, WSDOT will translate information about electronic tolling into multiple languages. WSDOT's demographic analysis did not indicate that general project information should be translated, but when WSDOT interviewed community and social-service providers in 2017, they recommended translation of materials about the project and tolling into Russian, Samoan, Spanish, Vietnamese, Chinese, and Cambodian.

Although no further mitigation is required, WSDOT anticipates exempting transit and paratransit (special transportation services for people with disabilities) from the tolls, which should further minimize the impacts of tolls on environmental justice populations. WSDOT exempts transit and paratransit on existing tolled facilities, but the Washington State Transportation Commission makes the final decision about toll exemptions. WSDOT is also planning to continue making it easier for people without a bank account to purchase and pre-load a *Good to Go!* pass—for example, selling them in local grocery stores and pharmacies and allowing people to use cash to load them. WSDOT is planning to expand the network for retail pass sales and options for customers who do not have a credit or debit card with which to open and maintain a *Good to Go!* pass, but there at the time of publication of this discipline report, there were no concrete details about the expansion.

Outcomes from interviews with community-based organizations and social service providers echo these recommendations.

Mitigation for Other Permanent Impacts

Table 10 compares mitigation outlined in the 2006 FEIS for Build Alternative with proposed mitigation for the Phase 1 Improvements.

Table 10. Comparison Summary of Mitigation: 2006 FEIS Build Alternative and Phase 1 Improvements	
Noise – 2006 Build Alternative	**Phase 1 Improvements**
WSDOT will provide noise barriers at appropriate areas where residents would likely be affected by traffic noise and where construction of the barriers is justified (through evaluation of feasible and reasonable criteria). Other possible mitigation measure could include building insulation and retaining existing trees and vegetation, thereby reducing noise annoyance psychologically by removing the noise source from view and constructing landforms.	Although Phase 1 improvements would not result in any new or significant noise impacts, there is one difference in noise mitigation since the 2006 FEIS. Just north of the future I-5/SR 167 Interchange in Fife Heights, there are new residences that were not built at the time of the 2006 FEIS. As such, WSDOT did not recommend a noise barrier at that location in the 2006 FEIS. Now that there are residences in the vicinity, WSDOT evaluated a noise barrier in that location, but it did not meet both the feasible and reasonable criteria. As such, WSDOT is not proposing a noise wall at this location.
Displacements of Residents – 2006 Build Alternative	**Phase 1 Improvements**
Displaced residents are eligible for relocation assistance to find suitable and comparable relocation sites under the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended. WSDOT is required to relocate displaced residents to a residence with similar costs and access to services. Review of the study area on July 14, 2006, identified 186 single-family homes for sale. WSDOT identified 83 single-family homes for rent, as well as 47 apartment complexes with vacancies. Therefore, more-than-adequate housing should be available for all persons displaced.	Mitigation for Phase 1 residential displacements would be the same as those described in the 2006 FEIS. For the six Hispanic families identified to date who are displaced, WSDOT has translated all documents related to the process into Spanish and engaged Spanish-language interpreters to attend all meetings with the families. The relocations will not take place until later in 2018, but with WSDOT's assistance, all six families have been able to locate comparable replacement housing in the same neighborhood as their current residences.
Community Cohesion – Build Alternative	**Phase 1 Improvements**
The 2006 FEIS concludes the effects to community cohesion would be minimal. To the extent possible, the final design would minimize the need for property acquisitions, which would further minimize effects to community cohesion.	WSDOT did not identify any new or significant impacts to community cohesion.
Effects to businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations – 2006 Build Alternative	**Phase 1 Improvements**
• Effects to fire, emergency, and police services during construction will be limited to temporary disruptions of service routes within the construction zone. Service providers affected by construction will be notified in advance of the construction period. Police, fire and emergency response, school districts, and solid waste providers will be notified of construction schedules, access restrictions, and possible detour routes prior to access modification. • To the extent possible, WSDOT will coordinate the scheduling of road closures and detour routes with police, fire, and emergency services, school districts and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will conform to state and local	Mitigation for effects to businesses, community gathering places, and faith-based organizations of importance to environmental justice populations will be the same as described in the 2006 FEIS. WSDOT did not identify any new or significant impacts to businesses, community gathering places, and faith-based organizations of particular importance to environmental justice populations.

Table 10. Comparison Summary of Mitigation: 2006 FEIS Build Alternative and Phase 1 Improvements	
regulations. Restricting lane closures and construction activities that affect traffic during peak commute hours and peak holiday travel periods can help to ease backups and time delays. Maintaining an open communication process will keep local residents informed of development phases, areas of construction, and possible travel alternatives.	
Parks and Recreational Resources – 2006 Build Alternative	**Phase 1 Improvements**
Through coordination with City of Fife, WSDOT incorporated elements into the 2006 Build Alternative design that will benefit the Pacific National Soccer Park. This includes strategies to reduce potential flood impacts to the Park. WSDOT also prepared an alternative design of the SR 167/I-5 interchange that reduced impacts to the planned soccer complex and allowed for six more soccer fields. WSDOT also committed to maintaining access to the Interurban Trail	Phase 1 does not include any new impacts requiring mitigation.

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7. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

WSDOT did not identify any construction impacts different from those described in the 2006 FEIS. Temporary construction-related effects to residents, businesses, and motorists in the study area—including environmental justice populations—would be the same as those described in the 2006 FEIS, including:

- Construction-related dust and noise
- Traffic congestion that may temporarily alter neighborhood travel patterns
- Visual presence of construction equipment and materials

The 2006 FEIS describes temporary construction impacts to the Benthion Loop neighborhood in the area of 54th Avenue East near the Port of Tacoma, Fife Heights, the City of Fife, and Milton. These communities would experience construction-related access disruptions, noise, dust, and visual effects. The Benthion Loop and Fife Heights communities have relatively high proportions of environmental justice populations, so these impacts will disproportionately affect environmental justice populations, but they are not new or more significant impacts than those documented in the 2006 EIS. WSDOT will mitigate for these effects; Section 8 describes these effects.

- Benthion Loop – 27 percent identify as minority, which is less than Tacoma and similar to Pierce County. 28 percent of individuals have incomes below the poverty level. This is much higher than Tacoma and more than double the poverty rate for Pierce County. (2011-2015 ACS 5-Year Estimates)
- Fife – 53 percent identify as minority, which is considerably higher than Pierce County. Much of Fife includes the Puyallup Indian Tribe Reservation, and Native Americans are among the groups considered to be minority under the President's Executive Order on Environmental Justice. 20 percent of individuals have incomes below the poverty level, which is higher than the poverty rate for Pierce County. In one census block group in Fife, more than 51 percent of the population has incomes below the poverty level. (2011-2015 ACS 5-Year Estimates). According to EJ Screen, there is at least one census block group in Fife where more than 5 percent of households are linguistically isolated and speak Spanish. (EJ Screen, 2017)

8. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Mitigation measures during construction have not changed since the 2006 FEIS. The *SR 167 Puyallup to SR 509 Land Use, Farmland, Social-Economic, and Environmental Justice Discipline Report* (November 2004) outlines the following mitigation measures:

- Completing the project in phases to minimize disturbance to local residences and businesses
- Notify first responders and school districts of construction schedules, access restrictions, and detour routes
- Conforming to local and state regulations for traffic control and restricting lane closures during peak commute hours and holiday travel periods

In addition, WSDOT will take these mitigation measures:

- Applying best management practices (BMPs) to control dust, noise, and visual impacts
- Developing and implementing traffic management plans to minimize traffic congestion and the effects of increased construction-related truck traffic on surrounding neighborhoods and arterials
- Requiring the contractors to provide at least one week's notice for major or highly disruptive construction activities
- When WSDOT notifies residents of Fife about construction-related activities, WSDOT will include a Spanish-language version on the notification, since Fife has some pockets of linguistically isolated, Spanish-speaking households.

9. How would cumulative and indirect effects compare to the 2006 FEIS Build Alternative?

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not create cumulative or indirect effects for environmental justice populations. Under NEPA, cumulative effects result from the incremental effects of a project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes the action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Cumulative effects include past, present, and reasonably foreseeable future actions within the study area that, together with the project, may have a cumulative effect on the environment. Past and present actions affecting environmental resources are reflected in the existing conditions of the project area.

With the introduction of tolling, WSDOT identified positive and negative cumulative effects of the Phase 1 Improvements on environmental justice populations in the SR 167 travelshed. The Phase 1 Improvements will contribute to a positive cumulative effect on regional transportation and will likely contribute to a negative cumulative effect on the economic burdens of low-income users of SR 167. The Phase 1 Improvements—in conjunction with other reasonable and foreseeable transportation investments in the SR 167 travelshed—will improve transportation conditions for all motorists in the SR 167 travelshed, including environmental justice populations.

As described earlier, tolls on the new proposed SR 167 Phase 1 Improvements would disproportionately affect low-income populations because the cost to use the new facility will represent a higher proportion of their household income than middle and high-income users. In addition, Washington State is considered to have the most regressive tax structure in the United States, according to the Institute on Taxation and Economic Policy (ITEP), a non-profit, non-partisan research organization. When considering the effect of tolls—another regressive form of taxation—on low-income households, it is important to consider them in the context of an already regressive tax structure. ITEP uses modeling to project the real-life economic effects of tax policies on taxpayers at every income level. Washington State's tax policies have multiple features that disproportionately burden lower-income taxpayers. According to ITEP, for households earning less than $21,000 a year, state and local taxes represent nearly 17 percent of household income, compared to families making over $100,000, who pay less than 7 percent of household income in state and local taxes (ITEP, 2015). In combination with rising housing costs in the Pierce County and Washington State's regressive tax system, tolling the new SR 167 Phase 1 facility will have a minor contribution to a negative cumulative effect on economic burdens of low-income motorists in the SR 167 travelshed.

The analyst considered whether multiple tolled facilities in the region would have a cumulative impact on environmental justice populations. Current tolled facilities include the Tacoma Narrows Bridge and SR 520 Bridge, express toll lanes on I-405, and high-occupant toll lanes on SR 167. Planned tolled facilities include tolling on the new SR 509 extension and an extension of express toll lanes on I-405. The analyst concluded, with the exception of the Tacoma Narrows Bridge, because accessible, convenient alternatives to using these tolled facilities would remain, there would be no negative cumulative effect on low-income motorists.

WSDOT did not identify any indirect impacts of Phase 1 to environmental justice populations.

10. How will WSDOT engage with environmental justice communities moving forward?

WSDOT will continue outreach for the Phase 1 Improvements through the project design, construction, and operation phases. Ongoing public involvement activities will include:

- Maintaining ongoing communications with community-based organizations and social service providers throughout design and construction of Phase 1 Improvements, and scheduling briefings and project milestones.
- Distributing project materials through social service agencies, community-based organizations, libraries, community groups, and schools.
- Hosting booths at community events in the study area.
- Conducting media outreach, specifically with ethnic media outlets serving the study area.
- Planning and implementing a public information campaign in English and the languages recommended by service providers who participated in interviews—Spanish, Cambodian, Chinese, Russian, Samoan, and Vietnamese—to explain tolling, how to obtain a *Good to Go!* pass, and how to set up an account.

Many service providers highlighted the importance of face-to-face communication for low-income populations, with many providers recommending community meetings with interpretation services. They added that a number of limited English proficient residents of the study area may have low literacy in their native language, thus reinforcing the importance of sharing information orally.

11. Conclusion - Would the Phase 1 Improvements have any new significant adverse impacts that would have a disproportionately high and adverse effect on environmental justice populations?

The adverse effects to environmental justice populations described in this discipline report are similar to those described in the 2006 FEIS, with one important exception: The 2006 FEIS did not include tolling of the Build Alternative. WSDOT's analysis considers the effects of tolling the proposed Phase 1 Improvements on environmental justice populations. WSDOT concludes that given the accessible and convenient untolled alternatives that will be available, tolling the new facility will not have a disproportionately high and adverse effect on environmental justice populations.

References

Washington State Department of Transportation. *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation (2006 FEIS).* November 2006. https://www.wsdot.wa.gov/NR/rdonlyres/8E2EE3CB-EE05-475C-88B0-B0ADFBBBB058/0/front.pdf. Last updated October 4, 2006.

United States Department of Justice. *Title VI of the Civil Rights Act of 1964.* https://www.justice.gov/crt/fcs/TitleVI-Overview. Last updated January 22, 2016.

United States Department of Transportation. *Final DOT Environmental Justice Order.* https://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/orders/order_56102a/. Last updated May 2, 2012.

Federal Highway Administration. 1998, 2012. *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. https://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/revised_strategy/index.cfm. Last updated January 19, 2017.

Federal Highway Administration. 2011. *Guidance on Environmental Justice and NEPA*. https://www.environment.fhwa.dot.gov/projdev/guidance_ej_nepa.asp. Last updated December 16, 2011.

United Stated Department of Health and Human Services. *U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Federal Programs*. 2017. https://aspe.hhs.gov/poverty-guidelines. Last updated January 26, 2017.

Federal Highway Administration. 2011. *Environmental Justice Emerging Trends and Best Practices Guidebook*. https://www.fhwa.dot.gov/environment/environmental_justice/resources/guidebook_2011/index.cfm. Last updated November 1, 2011.

Federal Highway Administration (FHWA). 2013. *Environmental Justice and NEPA in the Transportation Arena: Project Highlights*. http://www.fhwa.dot.gov/environment/environmental_justice/resources/ej_and_nepa/highlights. Last updated January 8, 2013.

Federal Highway Administration. 2015. *Environmental Justice Reference Guide*. http://www.fhwa.dot.gov/environment/environmental_justice/resources/reference_guide_2015/index.cfm. Last updated April 1, 2015.

United States Department of Justice. 2010. *Limited English Proficiency Frequently Asked Questions*. https://www.lep.gov/faqs/faqs.html#One_LEP_FAQ. Last updated April 25, 2011.

United States Census Bureau. (2001). *Census 2000 Summary File 100-Percent Data*. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_00_SF1_P004&prodType=table.

United States Census Bureau. (2011-2015). *2011-2015 American Community Survey 5-Year Estimates*. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_B03002&prodType=table.

United States Census Bureau. (2001). *Census 2000 Summary File 3*. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_00_SF3_P087&prodType=table.

United States Census Bureau. (2011-2015). *2011-2015 American Community Survey 5-Year Estimates*. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_B17021&prodType=table.

Washington Office of Superintendent of Public Instruction. (2006). *Enrollment Reports 2005-06* http://www.k12.wa.us/DataAdmin/enrollment.aspx.

Washington Office of Superintendent of Public Instruction. (2016). *2015-16 School Report Card*. http://reportcard.ospi.k12.wa.us/summary.aspx.

EJ Screen. (2017). *EJSCREEN ACS Summary Report.* https://ejscreen.epa.gov/mapper/

Washington State Department of Transportation. (2007). Providing Meaningful Language Assistance. http://www.wsdot.wa.gov/sites/default/files/2007/09/11/LEPPlan.pdf. Last updated September 11, 2007.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Transportation Discipline Report*.

Plotnick, R., Romich, J., Thacker, J. University of Washington. *The Impacts of Tolling on Low-Income Persons in the Puget Sound Region*. (2009). http://depts.washington.edu/trac/bulkdisk/pdf/721.1.pdf.

Washington State Department of Transportation (WSDOT). 2017. *Toll Rates*. Accessed on April 26, 2017 https://www.wsdot.wa.gov/Tolling/TollRates.htm.

Washington State Department of Transportation (WSDOT). (2012). *Toll Division 2012 SR 167 Online User Survey*.

Federal Highway Administration. 2017. *Urban Partnership Agreement Low-Income Equity Concerns of U.S. Road Pricing Initiatives*. https://ops.fhwa.dot.gov/congestionpricing/resources/lwincequityrpi.

U.S. Department of Housing and Urban Development Affordable Housing, https://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/. Accessed September 11, 2017.

Public Health Seattle & King County, http://www.kingcounty.gov/depts/health/data/~/media/depts/health/data/documents/demographics/high-housing-cost-burden.ashx. Accessed October 10, 2017.

Washington State Department of Transportation. September 2010. *SR 509 Toll Feasibility Study*. https://www.wsdot.wa.gov/sites/default/files/2011/01/25/SR509_TollingStudy.pdf.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Land Use and Socio-Economics Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Noise Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Public Services Technical Memorandum*.

Washington State Department of Transportation. (2017). *SR 167 NEPA Re-Evaluation Utilities Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Displacements, Disruption, and Relocations Technical Memorandum*.

Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington. December 2017. Short Report DOT17-03. Archaeological and Historical Services, Eastern Washington University.

Washington State Department of Commerce, *Affordable Housing Needs* Study (2015). http://www.commerce.wa.gov/wp-content/uploads/2016/10/AHAB-needs-study-Pierce.pdf.

GIS Data

U.S. Environmental Protection Agency EJ Screen, ESRI, U.S. Geological Survey (USGS) (2016).

Attachment A

Table 11. Hispanic and Non-White Populations in the SR 167 Phase 1 Improvements Study Area			
Census Tract	**Block Group**	**2010 Percent Hispanic**	**2010 Percent Non-White**
707.03	1	6.25%	29.5%
707.03	4	3.03%	10.9%
707.03	5	4.62%	19.5%
734.07	1	8.7%	22.5%
734.07	2	9.63%	23.9%
734.07	3	6.96%	20.5%
734.08	1	16.89%	37.4%
9400.02	1	6.97%	32.8%
9400.02	2	12.62%	53.6%
9400.02	3	9.8%	35.7%
9400.03	2	15.49%	55.5%
9400.03	3	36.27%	85.6%
9400.09	1	6.99%	23.3%
9400.09	2	5.83%	15.5%
9400.10	1	7.71%	27.3%
9400.10	2	4.93%	16.1%
Study Area Average		11.5%	34.7%

Water Resources

COPY TO:	**Project File**
PREPARED BY:	**Joy Michaud, Principal Scientist, Herrera Environmental Consultants**
DATE:	**August 7, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprise the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to water resources.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between: 1) the Puyallup termini of SR 167, SR 410, and SR 512 and 2) the Interstate 5 (I-5) corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

Table 1. Comparison of Design Components.

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade-separated at Alexander Avenue	Direct connection, single lane in each direction, at-grade connection east of Alexander Avenue
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	One-half SPUI to the East
SR 509 54th Avenue East to I-5	Four lanes (90 feet), 60 MPH posted speed	Four lanes (78 feet), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	Six lanes (152 feet): two GP lanes plus HOV lane in each direction, 60 MPH posted speed	Four lanes (78 feet): two GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	One-half Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	Six lanes: (152 feet): two GP lanes plus HOV lane in each direction, 60 MPH posted speed	Four lanes (78 feet): two GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Road connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Road to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts: one at 70th Avenue East and 20th Street East, and one on the new aligned 20th Street East	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	Two total: The first located east of the ramps for the 54th Avenue East interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue park and ride lots (two total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right-of-way; SPUI = single point urban interchange; a one-half diamond interchange has an on- and off-ramp that serves traffic to and from one direction.

2. What Are the Phase 1 Improvements and How Do They Compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, Tacoma, and portions of unincorporated Pierce County. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately 4 miles of a new, four-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River valley, and connecting to I-5 near the 70th Avenue crossing. The project also includes a new, approximately 2-mile highway section from SR 509 near the Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 Improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/SR 167/SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

3. What Has Changed in the Affected Environment Since 2006?

In general, the affected environment relative to water resources as described in Section 3.2.2 of the 2006 FEIS remains applicable to the SR 167 Completion Project's proposed new Phase 1 Improvements. The changes described below related to surface water quality, flooding and floodplains, and groundwater reflect changes in regulations or new information, not actual changes in the condition of the existing environment.

Water Quality

Although there has been no documented change (i.e., reports or publicly available data evaluated that indicate a change in condition) in the affected environment in terms of surface water quality since the 2006 FEIS, there has been a minor change in the criteria that are applied and in the status of identified impairments in some of the water bodies in the project area.

With respect to aquatic life criteria set forth in the Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC), the Puyallup River up to river mile 1.0 is still designated as "Salmonid Rearing and Migration Only." All other streams in the project area are now designated as "Salmonid Spawning, Rearing and Migration" as compared to "Salmon/Trout Spawning, Noncore Rearing and Migration" used in previous editions of the state's water quality criteria. These changes in nomenclature have not resulted in changes to the standards that are applied to these streams for protection of aquatic life.

The State of Washington performs a triennial review of water quality conditions and produces a statewide water quality assessment as described in the 2006 FEIS. The end product of the assessment is a categorization of every water body in the state from Category 1 (meets criteria) to Category 5 (impaired). The list of impaired waters (Category 5), is commonly referred to as the Section 303(d) list. During the development of the 2006 FEIS, the 2004 edition of the water quality assessment was used to develop a table of water quality impairments in the 2006 project area. The impaired waters list has been updated twice since the FEIS was published. The current list (the 2012 list, which was approved by EPA in 2016) was consulted for this re-evaluation effort. Table 2 provides a comparison of 303(d) listed parameters by water body from the 2004 and 2016 lists (Ecology 2016). As shown, there are five new listings and one removed listing; temperature and mercury are now listed in the Puyallup River, but bacteria is not; copper has been added in East Fork Hylebos Creek; and temperature and dissolved oxygen are listed in West Fork Hylebos Creek. All of the 2016 Category 5 listings were included in the 2004 assessment under Category 3. Category 3 listings indicate a problem was suspected but that the data or evaluation that was needed to justify an impairment listing was missing. Thus, the 2016 Category 5 listings appear to be a result of evaluation of available data rather than a change in the existing condition. Similarly, the Puyallup River is no longer listed as Category 5 for bacteria, because a water cleanup plan has been prepared to address the issue (Ecology 2011). The goal of the TMDL is to achieve bacteria water quality standards in the Puyallup by 2023. The TMDL sets FC bacteria reduction targets of 16 to 85 percent depending upon the stream and season. The SR 167 project area lies largely outside of the area covered by the TMDL and therefore no specific reduction targets have been set for the streams in the SR 167 project area (e.g., Hylebos, East Fork Hylebos, West Fork Hylebos, Fife Ditch, or Wapato).

Table 2. Summary of 303(d) Impaired (Category 5) Water Bodies in the SR 167 Completion Project Vicinity.

Water Body	Build Alternative (2006 FEIS) 2004 303(d) List	Phase 1 Improvements (Re-Evaluation) 2016 303(d) List
Puyallup River	Bacteria[a]	Temperature, Mercury
Hylebos Creek	Bacteria	Bacteria
East Fork Hylebos Creek	Bacteria	Bacteria, Copper
West Fork Hylebos Creek		Temperature, Dissolved Oxygen (DO)
Fife Ditch	DO, Ammonia-N	DO, Ammonia-N
Wapato Creek	Bacteria, DO	Bacteria, DO

[a] In the 2006 FEIS, "FC Bacteria" (referring to fecal coliform bacteria) was listed as the parameter of concern rather than "bacteria." While the water quality listings in the project area are based on measurements of fecal coliform bacteria, Washington State's water quality assessment database uses the term bacteria and that terminology is used here for consistency.

Overall, the changes in impairment listings do not represent a change in existing surface water quality conditions. In general, it is expected that water quality throughout the project area is generally in the same condition as described in the 2006 FEIS. Although land development has been proceeding quickly in the project vicinity since 2006, much of that development has been required to control or mitigate its potential water quality impacts via inclusion of stormwater treatment facilities.

Groundwater

The affected environment with respect to groundwater was described in the 2006 FEIS in relation to the condition of the underlying aquifer, contaminated sites, impervious surface coverage, and public water supply wells and their associated wellhead protection areas within the project footprint. One public water supply well in the project area has been decommissioned since the FEIS was published, but this does not reflect a significant change in existing conditions since there are currently 25 public wells with attendant wellhead protection areas in the project area.

One groundwater issue has arisen that was not described in the 2006 FEIS; some local residents have voiced concern that the frequency of groundwater flooding has increased in the past 10 years and is impeding use of their land. No new data are available to support or deny this concern (M. Piechowski, personal communication). It is possible that groundwater conditions have changed—whether this reflects development pressure, a change in climate patterns, or both, is unknown. To address this concern, WSDOT is developing a groundwater flow model for the project area. A MODFLOW model will be used to assess existing shallow groundwater elevations (and fluctuations through the year), flow directions, and connectivity of groundwater to creek channels, and will be used to predict future conditions as affected by the new highway corridor.

The 2006 FEIS listed two known contaminated sites that were impacting groundwater: the B&L Woodwaste landfill and the US Gypsum (also known as USG) landfill. Both had undergone remediation and were subjects of ongoing monitoring. The monitoring has continued, and data indicate that arsenic concentrations continue to be elevated in surface and groundwater near the two sites (Floyd-Snyder 2015; CDM Smith 2012). As part of the hazardous materials analysis conducted for the NEPA Re-Evaluation (INNOVEX 2018), 26 hazardous materials sites (including the B&L and USG sites) are within the project footprint or within one-half mile of the project footprint, compared to 31 sites identified in the 2006 FEIS. Twelve of the 26 sites were rated as high or moderate risk due to the level of soil or groundwater contamination. This information does not reflect a change relative to the affected environment, but an improvement in the information available.

Floodplains and Flooding

Due to uncertainties in evolving floodplain regulations, as well as inconsistencies between mapped floodplains and areas that have actually flooded in recent decades, the floodplain impact assessment for the 2006 FEIS used three different floodplain delineations: 1) the floodplain areas shown on flood insurance rate maps published by the Federal Emergency Management Agency (FEMA); 2) the ”flood prone area,” which was developed based on recent (at the time) flood events; and 3) results from hydraulic modeling that was done to inform conceptual project design. Ultimately, the acreage of floodplain impact due to the SR 167 Project was estimated in the 2006 FEIS based on mapping of the “flood prone area” overlain on the project footprint area. Since development of the FEIS, FEMA has published updated flood insurance rate maps for the Puyallup River and selected streams in the project area, as reflected in the National Flood Hazard Layer (NFHL) hosted online (updated in March 2017). The updated FEMA floodplain mapping is based on the assumption that the levees along the lower portion of the Puyallup River will not be damaged during flood events and that they will continue to provide flood protection until overtopped by extreme flows (i.e., flows with recurrence intervals greater than 100 years),and that during such a flood event the overtopping flows would not cause a levee breach that renders the levee ineffective at protecting inland areas from worse flooding. Pierce County and the cities in the SR 167 project area have adopted the updated flood insurance rate maps for regulatory purposes.

Figures 1 and 2 depict current and past (1990) 100-year floodplains in the project area, as well as the mapped flood-prone area used for the 2006 FEIS assessment. Since it is the intent of this NEPA Re-Evaluation to compare the level of impacts between the 2006 FEIS Build Alternative and the proposed SR 167 Project Phase 1 configuration, rather than to compare between different floodplain mapping assumptions, the newly published (FEMA 2017) 100-year floodplains were utilized to represent existing conditions.

Based on the information described above, the current conditions are assumed to be the same as those that existed during development of the 2006 FEIS.

4. Would the Phase 1 Improvements Result in Any New or Significant Impacts?

The impacts of the SR 167 Extension Project to water resources during operations were described in Section 3.2.5 of the 2006 FEIS. Impacts were estimated for the different creek basins, including the Hylebos (which includes Surprise Lake Tributary), Wapato, and Puyallup River, and were generally described in terms of land use, hydrology and flooding, water quality, and the proposed Riparian Restoration Program (RRP). The following discussion of impacts comparing the 2006 FEIS Build Alternative to the new proposed Phase 1 Improvements and configuration uses these same impact categories.

Land Use Changes

During development of the 2006 FEIS, planning documents from the various cities and Pierce County in the project area were used to model land use changes over time and this information was used to estimate and predict impervious surface area changes over time. Table 3 provides a comparison of impervious surface area to be created in each of the basins in the project area as estimated for the 2006 FEIS Build Alternative, and for the Phase 1 Improvements. As shown, the Phase 1 Improvements represent a significant (57 percent) decrease in impervious surface area as compared to the FEIS Build Alternative, because of the overall smaller footprint of the proposed Phase 1 design.

Table 3. Comparison of Impervious Surface Area Added by SR 167 Completion Project.

Basin	Acres of Impervious Surfaces	
	2006 FEIS Build Alternative	Phase 1 Improvements[a]
Hylebos[b]	129.4	46.4
Wapato	28.0	7.5
Lower Puyallup River	18[c]	21.7
TOTAL	175.4[d]	75.6

[a] These estimates are from the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). These are the best available estimates as of May 2018. They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

[b] Fife Ditch is included in the Hylebos Basin for this analysis.

[c] This was not reported in the 2006 FEIS but was estimated to be 50 percent of the approximately 33 to 39 acres of new impervious surface not accounted for in the Hylebos and Wapato basin estimates. Based on this, 18 acres was estimated for the Lower Puyallup River basin.

[d] This is not the same number reported in the 2006 FEIS because it includes the estimated acreage in the Lower Puyallup River basin.

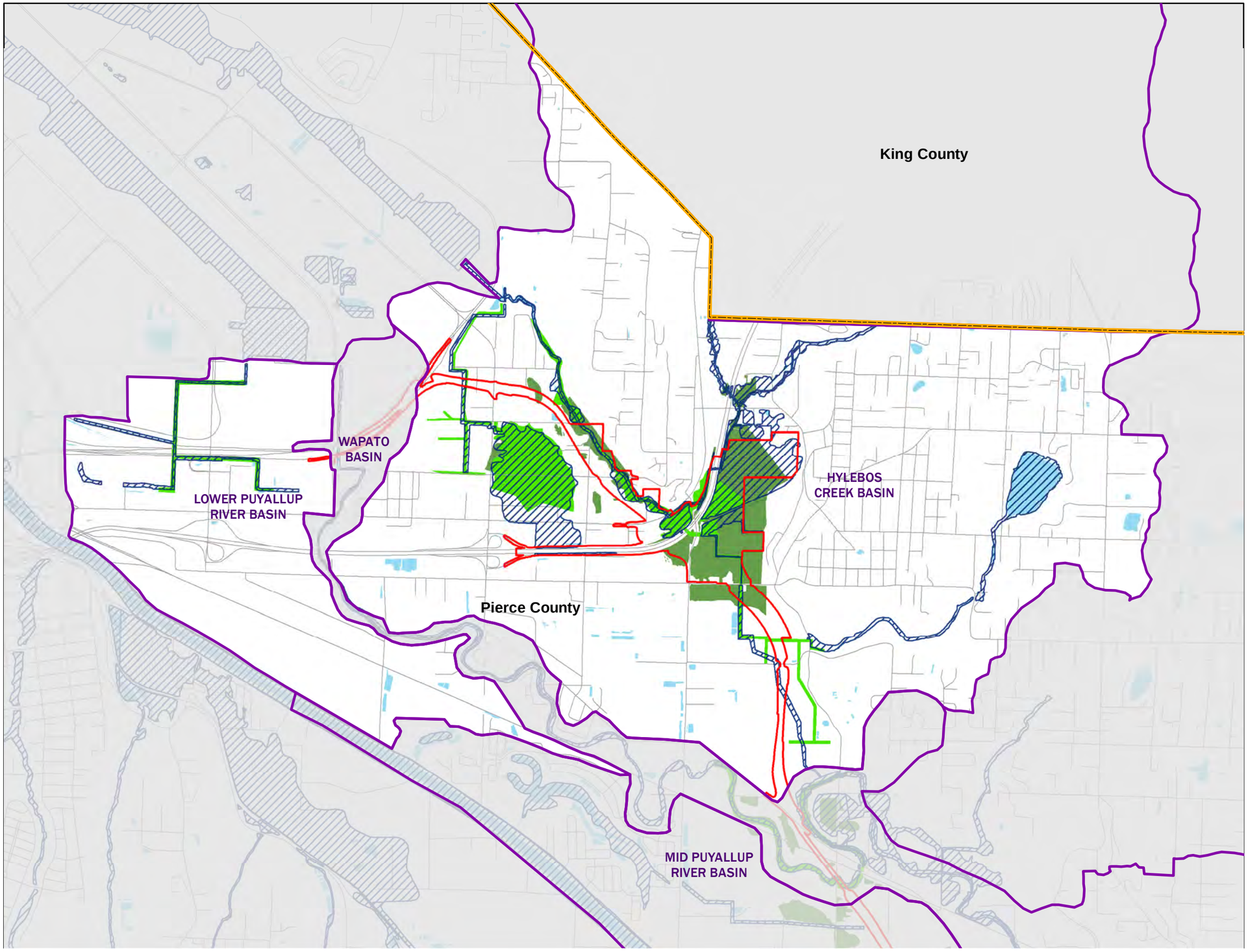

Figure 1.
Mapped Floodplain and Flood Prone Area in Hylebos Basin of SR 167 Completion Project Phase 1.

Legend

- Proposed Phase 1 Footprint
- County Boundary
- Watershed Boundary
- Waterbodies

Updated Floodplain Extents

- 2017 100-Year Floodplain (FEMA NFHL March 2017)

Previous Floodplain Extents

- 1996 Flood Prone Area
- 1990 100-Year Floodplain

Notes:
Previous Floodplain Extents are based on drawings produced for the original FEIS. The boundaries shown reflect extent limitations of the original figures.

N

0 1,250 2,500 5,000 Feet

HERRERA

King County

HYLEBOS CREEK BASIN

LOWER PUYALLUP RIVER BASIN

Pierce County

WAPATO BASIN

MID PUYALLUP RIVER BASIN

UPPER WAPATO BASIN

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Figure 2.
Mapped Floodplain and Flood Prone Area in Wapato and Puyallup Basins of SR 167 Completion Project Phase 1.

Legend

- Proposed Phase 1 Footprint
- County Boundary
- Watershed Boundary
- Waterbodies

Updated Floodplain Extents

- 2017 100-Year Floodplain (FEMA NFHL March 2017)

Previous Floodplain Extents

- 1996 Flood Prone Area
- 1990 100-Year Floodplain

Notes:
Previous Floodplain Extents are based on drawings produced for the original FEIS. The boundaries shown reflect extent limitations of the original figures.

N

0 1,250 2,500 5,000 Feet

HERRERA

Hydrology and Flooding

This updated assessment of hydrology and flooding impacts examined differences in the acreages of floodplain impact, potential changes to stream baseflows, and potential to affect streambank stability. In the 2006 FEIS, potential changes to the latter two categories were deemed insignificant between the Build and No Build Alternatives; therefore, this comparison of impacts between the 2006 FEIS Build Alternative and new proposed Phase 1 Improvements focuses only on changes in floodplain impacts.

As described previously, the most recent (March 2017) 100-year floodplain mapping published by FEMA was used to estimate the differences in impact area by overlaying the project footprints from both the 2006 FEIS Build Alternative and the Phase 1 Improvements over the 2017 mapped floodplain. This approach was taken because specific Geographic Information System (GIS) coordinates used to develop the FEIS footprint were not available; therefore, the footprint as shown in the FEIS map layer was re-created based on digitizing the footprint from figures presented in the 2006 FEIS.

Figures 3 and 4 illustrate the FEIS Build Alternative project footprint and the proposed Phase 1 Improvements Project footprint overlain on the mapped floodplains, respectively. The fact that the Phase 1 footprint is shown to be larger than the FEIS Build Alternative footprint is evidence of the discrepancies in the methods used and the resolution of the assessment. In reality, the impervious surface footprint and impact area for the proposed Phase 1 Improvements is smaller. Given the coarse scale of the current assessment (due to incomplete information available during this preliminary design phase), it can be conservatively assumed that the floodplain impacts are similar between the 2006 Build Alternative and proposed Phase 1 Improvements.

The estimated floodplain impacts based on the proposed Phase 1 alignment and footprint are summarized in Table 4 and shown in Figures 3 and 4. Approximately 95 acres of floodplain will be directly or indirectly impacted by the project, most of which will occur in the Hylebos Basin. As stated above, at this rough scale of comparative assessment, there are no significant differences in floodplain impacts between the FEIS Build Alternative and the proposed Phase 1 Improvements.

Table 4. Proposed SR 167 Completion Project Phase 1 Improvements Floodplain Impacts.[a]

Basin	Floodplain Area Within Basin (acres)	Floodplain Area Within Project Footprint (acres)
Hylebos	340.23	93.41
Lower Puyallup	19.92	0
Wapato	141.67	1.21
Upper Wapato	53.53	0.13
Mid Puyallup River	3,716.27	0
TOTAL	4,271.62	94.75

[a] Impacts from the 2006 FEIS footprint are assumed to have been similar at this scale of resolution.

Longer term impacts to flooding may occur as a result of hydrologic changes and sea level rise driven by climate change. Hydrologic changes are expected to include increases in the frequency and magnitude of high intensity rainfall and increases in the frequency of floodplain inundation (Herrera 2017). Higher intensity rainfall means that streams channels in the project area will experience increased flows; and where the RRP calls for channel modifications, those modifications will need to be designed to resist bank and bed erosion. Sea level rise alone is not expected to impact stream crossings in the project area, but when extreme storm events are coincident with the highest tide events, water surface elevations are predicted to rise in Hylebos and Wapato Creeks for a period of several hours longer than would be

experienced without sea level rise. Sea level rise could also indirectly impact the project area due to accelerated sedimentation in the Puyallup River. The RRP was reviewed in light of climate change, and it was determined that it would be much more effective than traditional engineering approaches to managing roadway runoff and that it is an effective strategy for climate change resilience (Herrera 2017). The RRP approach provides a buffer against climate change uncertainty because it uses natural processes and landscape features to separate the highway from the environment (Herrera 2017).

The SR 167 completion project is planning for climate change in terms of structure sizing at roadway crossings and channel modification designs for those crossings subject to sea level rise impacts. Hydrologic changes are incorporated as a part of updated hydraulic modeling. The RRP document will detail the cumulative effects of climate change on the project.

Water Quality

Impervious surface area was used as a surrogate measure of water quality impacts in the 2006 FEIS. In the FEIS, future basin-wide percent impervious surface area was estimated both with and without the new highway corridor. It was shown that the percentage of new impervious surface area planned in the highway corridor was insignificant when compared to the overall expected increase in impervious surface coverage due to unrelated land development and urbanization occurring in the area. Therefore, the current comparison of differences between the 2006 FEIS and the proposed Phase 1 Improvements focuses specifically on the differences in impervious surface area and associated pollutant loading. Estimates of pollutant yields per acre (i.e., kilograms/acre/year) delivered by roadway systems was applied to the estimated increase in impervious surface area in each basin and used to generate estimates of the annual mass loading increases in surface runoff for various pollutants that could be attributed directly to the new highway. Since the Phase 1 Improvements will result in a decrease in impervious surface area that would be attributed to the proposed highway as compared to the FEIS Build Alternative, the pollutant loads would be expected to decrease. Table 5 summarizes the predicted annual pollutant loads as reported in the 2006 FEIS and as calculated for the proposed Phase 1 Improvements. As shown, pollutant loads generated as a result of the Phase 1 Improvements are anticipated to decrease by 57 percent when compared to the loads predicted under the 2006 FEIS Build Alternative, correlating to the decrease in impervious surface area.

Table 5. Comparison of Pollutant Loading from Untreated Stormwater Generated by the SR 167 Completion Project Impervious Surfaces.

	2006 FEIS Build Alternative	Phase 1 Improvements	Percent Reduction
Acres of Impervious Surfaces Added	175.4	75.6[a]	57
Pollutant	***Pollutant Load (Kilograms/Year) (Pounds/Year in parentheses)***		
Total suspended solids (TSS)	35,633 (78,557)	15,322 (33,779)	
Total phosphorus (TP)	78 (172)	34 (75)	
Total nitrogen (TN)	170 (375)	73 (161)	
Lead, total (Pb)	55 (121)	24 (53)	
Zinc, total (Zn)	22 (49)	10 (22)	
Copper, total (Cu)	4 (9)	2 (4)	

[a] This estimate is from the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). This is the best available estimate as of May 2018. It may change as the design progresses, but any change is not expected to substantially change the level of impact.

King County

WAPATO BASIN

LOWER PUYALLUP RIVER BASIN

HYLEBOS CREEK BASIN

Pierce County

MID PUYALLUP RIVER BASIN

Figure 3.
Comparison of Floodplain Impact Area for 2006 Build Alternative and Phase 1 Improvements in Hylebos Basin of SR 167 Project Area.

Legend

- County Boundary
- Watershed Boundary
- Waterbodies
- 2006 Build Alternative
- Proposed Phase 1 Footprint

Updated Floodplain Extents

- 2017 100-Year Floodplain (FEMA NFHL March 2017)

Notes:
The 2006 Build Alternative as shown is a recreation of the original footprint and may not reflect the exact extents shown in the original figures.

N

0 1,250 2,500 5,000 Feet

HERRERA

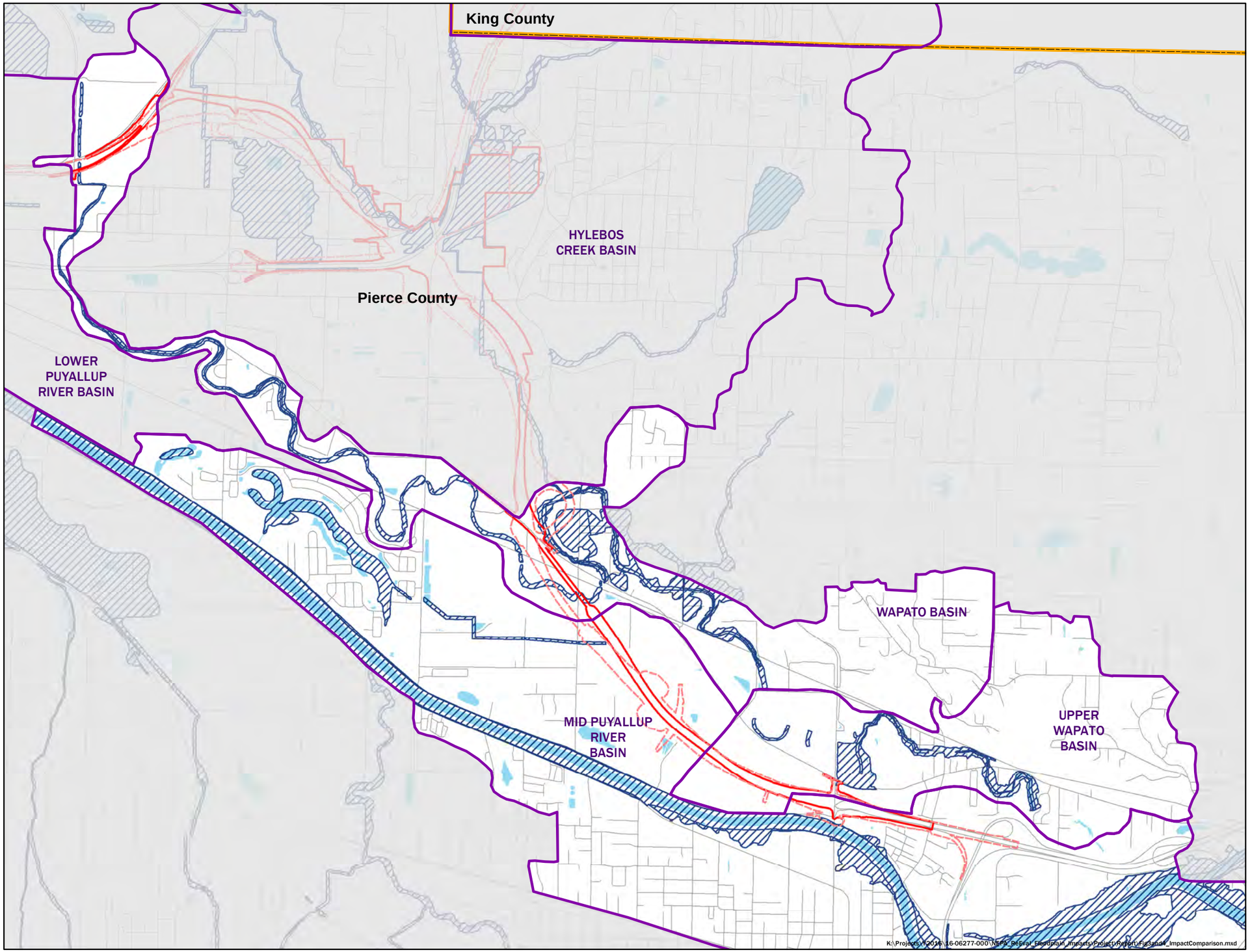


Figure 4.
Comparison of Floodplain Impact Area for 2006 Build Alternative and Phase 1 Improvements in Wapato and Puyallup Basins of SR 167 Project Area.

Legend

- County Boundary
- Watershed Boundary
- Waterbodies
- 2006 Build Alternative
- Proposed Phase 1 Footprint

Updated Floodplain Extents

- 2017 100-Year Floodplain (FEMA NFHL March 2017)

Notes:
The 2006 Build Alternative as shown is a recreation of the original footprint and may not reflect the exact extents shown in the original figures.

N

0 1,250 2,500 5,000 Feet

HERRERA

The pollutant loading estimates shown in Table 5 do not account for effectiveness of required stormwater treatment facilities. Stormwater generated by the highway will be required to meet the most recent version of the WSDOT Highway Runoff Manual (HRM). This means that at a minimum, Basic Treatment requirements will need to be met. However, based on the HRM, for the majority of the project area Enhanced Treatment (to ensure greater removal of dissolved metals) will be required; and WSDOT is proposing its use for the entire project, where practicable. This was also the case for the 2006 FEIS.

Impervious surface is the metric most commonly used for quantifying pollutant loads and is appropriate for most land use types. However, for highways where the source of pollutants is related to the number of vehicles using the highway, Average Daily Traffic (ADT), which is expressed as a range in traffic, is also used as an indirect measure of expected pollutant loading. The traffic volumes expected on the new proposed Phase 1 highway are anticipated to be within the same relative ADT range as was estimated for the 2006 FEIS Build Alternative; this is the case even when accounting for decreased vehicle use as a result of tolling. Therefore, although in terms of impervious area, Table 5 predicts a substantial decrease in pollutant loads generated by the Phase 1 Improvements due to the decrease in impervious area, from a practical viewpoint the difference is not expected to be significant because vehicle use is expected to be similar.

The parameters included on the Section 303(d) list at the time for project receiving waters (i.e., bacteria, dissolved oxygen, and ammonia) were not typically associated with highway runoff (WSDOT 2006). For the proposed Phase 1 Improvements, temperature, a recently added listing for the West Fork of Hylebos Creek, could ostensibly be impacted by highway runoff since rain falling on warm pavement during summer months becomes warmer. However, the volume of rainfall that occurs during summer is typically small and it is expected that runoff would only infrequently reach streams in the project area during summer. Therefore, the proposed Phase 1 Improvements are not expected to directly impact surface water temperatures at critical times.

Mercury is another more recent water quality impairment listing in the project area. Although mercury is measured in surface water runoff, the originating source is believed to be atmospheric deposition or possibly re-release from historical sources (Ecology and King County, 2011). Either way it is not a contaminant that is typically associated with highway runoff. However, copper—which has recently been identified as an impairment in the East Fork of Hylebos Creek—is a contaminant common in highway runoff. Although site-specific stormwater management design plans for the SR 167 Completion Project are not yet available, the HRM requires that Enhanced Treatment be provided for the majority of the highway; and it is WSDOT's stated intent to provide Enhanced Treatment wherever practicable on the project. Enhanced Treatment goals include removal of greater than 30 percent of dissolved copper. Overall, stormwater treatment requirements will essentially be the same between the 2006 FEIS and proposed Phase 1 Improvements. Thus, the potential for loading of these pollutants to streams in the project area, including those with listed impairments, does not change. The improved and wider stream buffers associated with the RRPs should also result in removal of some of the pollutants that are being delivered to Hylebos Creek under existing conditions, but this expected effect of the RRPs on water quality has not been quantified.

Groundwater

Potential groundwater impacts described in the 2006 FEIS were associated with increased potential for contaminant spills from vehicles using the roadway, as well as potential for contaminants associated with WSDOT maintenance activities, such as herbicides and pesticides or de-icing materials. The potential for contaminant spills or use of chemicals is effectively the same for the FEIS Build Alternative and the proposed Phase 1 Improvements.

Another potential impact to groundwater that was evaluated in the 2006 FEIS was a possible decrease in aquifer recharge due to increased soil compaction and increased impervious surface area, both of which would increase stormwater runoff at the expense of groundwater infiltration and recharge. The significant reduction in impervious surface area resulting from the proposed Phase 1 Improvements, as compared to the FEIS Build Alternative, should equate to a decreased risk of reducing aquifer recharge. However, the scale of this reduction is not significant when compared to the influence of larger surrounding land areas in the Puyallup River valley on aquifer recharge.

There are also water quality risks associated with existing contaminated sites; disruption of these sites could result in the release of contaminants to water resources. The major construction activities where soil and groundwater contamination could be encountered are associated with drilled shafts and the construction of new stream corridors. Four sites of potential concern will have drilled shafts constructed in them. The soil and/or groundwater contamination in these specific areas will be characterized to determine the appropriate cleanup measures. Project design changes have already occurred to avoid excavation and grading in proximity to known areas of contamination, or otherwise assuring those areas will be cleaned up before SR 167 Project construction occurs. The proposed realignment of Hylebos Creek and Surprise Lake Tributary as part of the RRP will avoid the B&L Woodwaste site, and the existing Hylebos Creek channel near the US Gypsum site west of I-5 will be filled, thus reducing the risk of water quality impacts associated with these sites.

At all potentially contaminated sites, WSDOT will take all necessary steps to contain, characterize and properly treat or dispose contaminated soils and groundwater. The hazardous materials analysis (INNOVEX 2018) conducted for the NEPA Re-Evaluation details the known risks and applicable mitigation measures for the identified sites.

Although the proposed Phase 1 Improvement footprint is smaller than that of the 2006 FEIS Build Alternative, the number of hazardous materials sites potentially impacted is only slightly fewer for the Phase 1 Improvements; therefore, the risks from contamination have not substantially changed.

Riparian Restoration Program

As described in the 2006 FEIS, the Riparian Restoration Program (or RRP; note that it was referred to as the Riparian Restoration Proposal in the FEIS) represents an innovative approach to offset impacts to streams, riparian and wetland areas, and floodplain storage while also providing stream and habitat benefits. The RRP involves removal of existing structures that encroach on the floodplain in the RRP areas and restores the riparian ecosystem and natural course of flooding through creation of new stream channels, removal of undersized culverts, improvements to riparian vegetation, and protection of large riparian buffers. A *Net Environmental Benefits Analysis* (*NEBA*) was performed to quantitatively estimate and compare the relative losses and gains between conventional stormwater control and the RRP approach in preparation for the 2006 FEIS. The RRP was found to have 57 percent greater environmental benefit than the conventional approach. While the RRP concept has initial support from Ecology, because it represents an alternative approach to meeting HRM requirements there is a formal process of review that is required before this alternative approach can be approved; this process has yet to occur.

There are two elements of the RRP proposed for the project: 1) the Hylebos RRP, which includes area in the Upper and Lower Hylebos as well as in Surprise Lake Tributary, and 2) the Wapato RRP.

The goal of the Hylebos RRP is to restore and manage fluvial and riparian processes through a watershed-based approach rather than through traditional stormwater management facilities, and to provide mitigation for stream channel and riparian corridor impacts from the SR 167 Completion Project in the Hylebos basin. The Hylebos RRP components, as described in the Water Resources section of the 2006 FEIS, include relocation and restoration of new stream channel, restoration of un-relocated stream channel, and conversion and protection of riparian area. Addition of large woody debris is also a

component of the proposed Phase 1 Improvements RRP, but was not specifically addressed in earlier conceptual design of the RRP).

The Hylebos RRP has evolved since the 2006 FEIS; the overall size of the riparian buffer area has been significantly reduced and the location shifted because of property ownership changes, but a longer contiguous corridor of the stream will be protected (Table 6). In the Surprise Lake Tributary area (called Surprise Lake Drain in the 2006 FEIS), compared to the 2006 FEIS the Phase 1 Improvements will result in a slight decrease in restored buffer and a significant reduction in the length of stream corridor protected. Overall, the stream length and riparian buffer improvements in the Hylebos basin (Hylebos and Surprise Lake Drain) represent 5 percent and 15 percent reduction, respectively, from the improvements assumed for the 2006 FEIS Build Alternative. These are small changes when compared to the reduction in the size of the overall project footprint.

Table 6. Comparison of Stream Improvements and RRP Buffers Between the 2006 FEIS Build Alternative and Proposed Phase 1 Improvements.

Project Elements	Build Alternative (2006 FEIS)	Phase 1 Improvements (Re-Evaluation)[a]
Hylebos Stream Improvements (feet)	4,010	4,500
Hylebos Riparian Buffer (acres)	87	70
Surprise Lake Drain Stream Improvements (feet)	5,340	4,380
Surprise Lake Drain Riparian Buffer (acres)	29	28
Wapato Creek Riparian Buffer (acres)	73	12
Total Stream Improvements (feet)	9,350	8,880
Total Riparian Buffer Gains (acres)	189	110

[a] These estimates are from Table 2 in the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). These are the best available estimates as of May 2018. They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

The Wapato RRP as presented in the 2006 FEIS was intended as informal, extra mitigation for roadway impacts. At the time of the FEIS, the RRP was still conceptual and had not been formally submitted to resource agencies for review. As shown in Table 6, the Wapato RRP as conceived for the 2006 FEIS Build Alternative potentially included 73 acres of riparian buffer. The size of the buffer area did not correlate to roadway impacts but to opportunities associated with available undeveloped areas. The Wapato RRP described for the Phase 1 Improvements includes 12 acres of riparian restoration, a significant decrease when compared to the Wapato RRP concept discussed in the 2006 FEIS. Again, the size of the proposed Wapato RRP is based on opportunities, rather than impacts. For example, WSDOT will not be acquiring a 21-acre parcel that was previously needed for a loop ramp that is no longer in the proposed Phase 1 Improvements design plans. That parcel was to be part of the Wapato RRP as originally conceived, and this opportunity no longer exists.

5. How Would Mitigation Measures During Operation Compare to the 2006 FEIS Build Alternative?

As documented in Sections 3.2.5 through 3.2.7 of the 2006 FEIS, the primary water resource impacts associated with operation of the new highway include loss of floodplain storage and potential increase in pollutant loads to local surface waters. As described in Section 4 of this technical memorandum, these

operational impacts are estimated to be somewhat less under the proposed Phase 1 Improvements as compared to the 2006 FEIS Build Alternative. Overall mitigation needs would be similar between the FEIS Build Alternative and the Phase 1 Improvements. As summarized in Section 3.2.9 of the FEIS, operational impacts on water resources can largely be avoided or mitigated through thoughtful project design, and will be further mitigated as the project progresses through local, state, and federal environmental permitting. The operational mitigation measures identified in the 2006 FEIS were related to reducing flood elevations at the 20th Street East and northbound I-5 bridges, as well as designing all new stream crossings to pass the 100-year storm event at a minimum, and minimizing channel constriction and riprap placement at these crossings. These mitigation measures were environmental commitments in the 2007 ROD and will remain commitments under the new proposed Phase 1 Improvements.

In summary, mitigation measures required for operations would be similar under both the 2006 FEIS Build Alternative and the proposed Phase 1 Improvements configuration. No new impacts that would require additional mitigation have been identified for the Phase 1 Improvements.

6. How Would Temporary Construction Effects Compare to the 2006 FEIS Build Alternative?

The impacts of the SR 167 Project to water resources during operations were described in Section 3.2.4 of the 2006 FEIS. The temporary construction effects discussed in the 2006 FEIS remain applicable to the proposed Phase 1 Improvements. This determination is based on an evaluation of acres of land subject to clearing and grading, the number of stream crossings, and the total number of near-water work sites, which is defined as the sum of the temporary, new, and improved or removed stream crossings. These impacts are summarized in Table 7. As shown, construction impacts are significantly reduced under the proposed Phase 1 Improvements for nearly all types of impacts considered. The one exception is that there is one additional wellhead protection zone that would be crossed under the Phase 1 Improvements, but overall, the Phase 1 Improvements have a greatly reduced level of construction impacts both for total acres of clearing and grading and the number of near-water work sites.

Table 7. Comparison of Construction Impacts Between the 2006 FEIS Build Alternative and Proposed Phase 1 Improvements.

Project Elements	Build Alternative (2006 FEIS)	Phase 1 Improvements (Re-Evaluation)[a]
Acres of Clearing and Grading (includes that associated with RRP)	720	375
Wellhead Protection Zones Crossed	22	23
Temporary Stream Crossings	12	0
New Stream Crossings	13	7
Existing Stream Crossings Improved or Removed	23	12
Near-Water Work Sites	48	21

[a] These estimates are from the April 2018 ESA Section 7 Formal Reinitiation report (NMFS 2018). These are the best available estimates as of May 2018. They may change as the design progresses, but any changes are not expected to substantially change the level of impact.

Construction impacts to water resources resulting from the project also include those associated with relocation/construction of new stream channels, and restoration of riparian areas and riparian buffers

that are planned to mitigate for project impacts. As described previously (Table 6) the stream channel and riparian buffer improvements would be reduced under the proposed Phase 1 Improvements; thus, the Phase 1 Improvements would have a reduced level of construction impacts compared to the 2006 FEIS Build Alternative.

7. How Would Mitigation Measures During Construction Compare to the 2006 FEIS Build Alternative?

Mitigation during the construction phase identified in the 2006 FEIS includes implementing standard WSDOT Best Management Practices (BMPs) to reduce erosion and off-site sediment movement, proper use of construction staging areas, and BMPs related to storage and containment of fuels and other contaminants. The construction mitigation measures as described in Sections 3.2.8 and 3.2.9 of the 2006 FEIS remain applicable to the proposed Phase 1 Improvements and as documented in the 2007 ROD.

A Temporary Erosion and Sediment Control (TESC) Plan and a Spill Prevention, Control, and Countermeasures (SPCC) Plan will be prepared and implemented during each stage of project construction, as required by the WSDOT Highway Runoff Manual (WSDOT 2016). As a minimum, the plans will include the following construction BMPs:

- Erosion control measures for cut and fill slopes
- Sediment control measures, particularly for work near streams and storm drain inlets
- Temporary erosion protection measures for disturbed areas
- Reseeding and stabilization for cut and fill slopes as necessary
- Reseeding and/or replanting of temporarily impacted areas with appropriate native seed mixes/species to the greatest extent possible
- Confining fuels, oils, and other potential contaminants within a berm or barrier when staging areas cannot be located outside of frequently flooded areas
- Limiting fueling and vehicle maintenance near water bodies and sensitive areas
- Identifying proper construction equipment maintenance, cleaning, and access locations
- Requiring proper hazardous and conventional waste disposal
- Scheduling and timing of construction activities appropriate for the season
- Monitoring and maintaining erosion and sediment control BMPs

In addition to TESC and SPCC Plans, the following project-specific measures will minimize effects on water resources during construction:

- A Stormwater Pollution Prevention Plan (SWPPP) will be fully implemented before, during, and after construction.
- Alternative construction techniques that minimize or avoid dewatering (e.g., sheet piling, cased piers, driven piling, spread footings) will be evaluated.
- A temporary Hylebos Creek diversion channel will be constructed while the creek remains within its existing streambed. Measures to minimize streambank erosion in the temporary channel will be employed.
- Trees and shrubs, when present adjacent to the alignment, will be preserved provided that roadway clear-zone and sight distance requirements are met.

In summary, mitigation measures required during construction for the proposed Phase 1 Improvements are consistent with what was documented for the 2006 FEIS Build Alternative. No new impacts that would require additional mitigation have been identified for the Phase 1 Improvements.

8. Conclusion

No new or significant impacts to water resources from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. Therefore, no new or revised mitigation measures are required.

References

CDM Smith 2012. Draft Remedial Investigation Report USG Interiors Highway 99 Site, Milton, Washington. Prepared for USG Corporation. July 11.

Ecology and King County. 2011. Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in the Puget Sound Basin, 2007–2011. Washington State Department of Ecology and King County Department of Natural Resources. Publication No. 11-03-055.

Ecology. 2011. Puyallup River Watershed Fecal Coliform Total Maximum Daily Load. Water Quality Improvement Report and Implementation Plan. Washington State Department of Ecology Publication No. 11-10-040. June.

Ecology. 2016. Washington State Water Quality Assessment. Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC). <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d>.

FEMA. 2017. Federal Emergency Management Act, National Flood Hazard Layer. March. <https://www.fema.gov/national-flood-hazard-layer-nfhl>.

Floyd-Snyder. 2015. B&L Woodwaste Site, Pierce County, WA. Compliance Monitoring Data Report. April 2015. Prepared for: B&L Custodial Trust.

Herrera. 2017. Discussion Paper: Applicability of the SR 167 Completion Project Riparian Restoration Program as an Adaptation Strategy for Climate Resilience. Prepared for Washington State Department of Transportation and WSP USA. May 23.

INNOVEX. 2018. State Route 167 Completion Project Phase 1—Hazardous Materials Technical Memorandum for NEPA Re-Evaluation. Prepared by Glenn A. Hayman. June 18.

NMFS. 2018. State Route 167 Completion Project Stage 1 – ESA Section 7 Formal Reinitiation. NMFS Tracking number: 2005/05617, 2012/03666. April 16.

Piechowski, M. 2018. Mike Piechowski, Robinson-Noble. Personal Phone Communication. April 24.

WSDOT 2006. SR 167 Puyallup to SR 509 – Tier II Final Environmental Impact Statement and Section 4(f) Evaluation. Chapter 3.2 Water Resources. November.

WSDOT 2016. Highway Runoff Manual. M 31-16.04. Supplement February.

Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements Vicinity Map



Wetlands

COPY TO:	**Project File**
PREPARED BY:	**Paul Dreisbach, Biologist, WSDOT Olympic Region - Environmental & Hydraulic Services Office**
DATE:	**February 22, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to wetlands.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the Interstate 5 (I-5) corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design.

The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection at Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed

SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

Methods

WSDOT Olympic Region Environmental & Hydraulic Services Office (OR EHS) conducted a wetland inventory in 2015 to provide preliminary information to supplement the 2005 Wetlands Discipline Report (WDR) (WSDOT 2005) which served as the basis for the 2006 FEIS. The 2015 inventory identified wetland locations, estimated size, anticipated category, generalized functions, and provided preliminary information regarding anticipated wetland and buffer impacts. The 2015 inventory was re-verified by OR EHS in the Fall of 2017 to again document conditions and bring existing wetland conditions up-to-date. Changes in existing conditions for wetlands between 2015 and 2017 were few and generally minor. Thus, for the purposes of this report, the 2015 date of the wetland inventory was retained throughout this report. Formal wetland delineation, rating, and functions assessment will be necessary prior to project permitting.

The 2015 wetland inventory approach was deemed the appropriate level of documentation to supplement the 2005 WDR, and support WSDOT's current NEPA Re-Evaluation process for the following reasons:

- The entire growing season from March through September, prior to the fall 2015 field work was characterized by drought conditions with drier than normal precipitation (Appendix A-1, Table 1 and 2). These drought conditions reduce accuracy of delineated wetland boundaries and result in problematic delineation situations. Delineations will be more accurate when performed during periods with normal precipitation. In addition, many of the wetlands within the project corridor are farmed wetlands, which can also result in problematic delineations and further necessitate normal precipitation conditions for accurate and meaningful delineation results.
- Delineations require significantly more time than wetland inventory and are only considered valid by regulatory agencies for five years following field work. Scheduling the wetland delineation at a future date, nearer the environmental permitting phase of the SR 167 Completion Project should eliminate the possibility that the completed wetland delineation will exceed the 5-year shelf life and need to be re-done.

Future delineations and ratings for this project will be conducted during a period with normal precipitation and closer to project permitting and construction, to ensure they are accurate and remain valid.

This technical memorandum documents observable changes to wetlands that have occurred between the 2005 WDR (supporting the 2006 FEIS) through the Fall 2015 wetland inventory, and as re-verified in the Fall of 2017. This memorandum also notes when conditions remain unchanged, and:

- Confirms wetland presence and approximate boundaries identified in the 2005 WDR, where the 2006 FEIS Build Alternative alignment and the proposed SR 167 Project Phase refined alignment overlap,
- Identifies potential wetland boundary amendments of delineated wetlands documented in the 2005 WDR,
- Identifies additional wetlands previously unidentified in the 2005 WDR, and occurring in the proposed SR 167 Phase 1 alignment,
- Omits wetlands identified in the 2005 WDR that are no longer present in the proposed SR 167 Phase 1 alignment, or that have been determined to be non-jurisdictional wetlands,
- Inventories additional areas for wetlands that were not included in the 2006 FEIS alignment, which are now included in the proposed Phase 1 alignment, and
- Updates current potential wetland and buffer impacts based on the 2017 re-verification.

Wetland Identification, Classification, Functions, and Buffers

The 2005 WDR documents wetland delineation data collected in or prior to 2005 and occurring within project limits identified in the 2006 FEIS. The proposed SR 167 Phase 1 Improvements alignment includes many of the same locations, however the alignment was shifted to avoid and minimize impacts to environmentally sensitive areas, natural and cultural resources, preexisting development, and to minimize project costs and risks. Therefore, a wetland inventory covering the extent of the new alignment was completed through on site field investigation between September and December 2015, and subsequently updated via field survey conducted in October 2017 to verify current conditions.

2017 Inventory

Wetlands previously identified in the 2005 WDR were reviewed, and most were retained in the 2015 inventory. Some wetland boundaries were adjusted as an outcome of the 2015 inventory, and some previously identified wetlands were omitted, either as a result of development activities that had occurred in the corridor since the 2005 delineation or because the wetland features had been determined to be non-jurisdictional. Some entirely new wetlands were identified and added in the 2015 inventory. For the 2017 inventory, wetland determinations were made using observable vegetation and hydrology indicators in accordance with methods described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). Soil pits were not excavated, however, NRCS hydric soil maps were reviewed (NRCS 2017d). Wetland boundaries were estimated based on field observations and background information (Attachment B).

In addition to field observations and documentation in the 2005 WDR, the following data sources were reviewed for information on precipitation, soils, vegetation patterns, potential or known wetlands in the project vicinity, topography, and drainage:

- Natural Resources Conservation Service (NRCS) Climate Data for Pierce County, Washington (NRCS 2017a),
- NRCS Washington State Hydric Soil list (NRCS 2017b) and map units (NRCS 2017d),
- NRCS official soils series descriptions (NRCS 2017c),
- Aerial photographs (ESRI 2017),
- National Wetland Inventory (NWI) maps (USFWS 1996), and
- U.S. Geological Survey (USGS) 7.5 minute topographic maps (USGS 2017).

Wetlands were classified using the US Fish and Wildlife Service (USFWS) classification system (FGDC 2013) and the Hydrogeomorphic Classification system (HGM) (Brinson 1993). Wetland functions were generally assessed based on the Wetland Functions Characterization Tool for Linear Projects (Null et al. 2000). A more detailed assessment of functions will be necessary prior to SR 167 Completion Project environmental permitting.

Wetland categories in the 2005 WDR were assigned using the Washington State Wetland Rating System for Western Washington - Revised (Hruby 2004) (2004 rating system). Wetland categories were reviewed in 2015, and again during the 2017 field verification. In most cases the rating is assumed to remain unchanged based on field observations, background information, and the methods described in the Washington State Wetland Rating System for Western Washington – 2014 Update (Hruby 2014) (2014 rating system). For the 2017 verification, best professional judgment was used based on the 2014 rating system, field observations, and background information, to assign an assumed wetland category to newly identified wetlands, or wetlands identified in the 2005 WDR where conditions were observed to have changed.

Regulatory buffer requirements are based on the requirements of local jurisdictions. Buffer requirements for wetlands were identified based on the following local jurisdiction's municipal codes: City of Milton (Milton 2017), City of Fife (Fife 2017), City of Puyallup (Puyallup 2017), and Pierce County (Pierce County 2017). Each of the applicable local jurisdictions codes are based on the 2004 rating system. Tables for converting categories and function scores between the 2004 and 2014 rating systems are available from Ecology (Ecology 2017).

Wetland Naming

Wetland names assigned in the 2005 WDR were retained in this 2017 memorandum so that information provided in the 2005 WDR remains easy to reference for comparison. Newly identified wetlands added to the inventory during 2015 field work are easily distinguishable from wetlands identified in the 2005 WDR by the 2015 prefix included in the wetland name.

If a wetland identified in the 2005 WDR was omitted because it is no longer present, the name does not appear in this memorandum. As a result, the alphabetical and numerical order of names is not sequential. If a named wetland letter or number is missing in this report, it is because it has disappeared from the landscape since the 2005 WDR, it does not occur within the new proposed Phase 1 alignment, or has since been determined to be non-jurisdictional.

As previously discussed, the re-verification completed in October 2017 documents any meaningful changes in wetland conditions. No new wetlands were added to the inventory as a result of the 2017 re-verification effort.

Landscape Setting

The SR 167 Completion Project is situated in the Puget Sound lowlands in the lower Puyallup River Valley southeast and inland of Commencement Bay. The Puyallup River headwaters originate from several glaciers on the north and west sides of Mount Rainier, collecting water from two main tributaries along the way: the Carbon River and the White River. The project is in the Lunds Gulch-Frontal Puget Sound watershed (watershed 1711001902) (BLM 2017) at the lower extent of Water Resource Inventory Area (WRIA) 10 Puyallup-White (Ecology 2000), and occurs near sea level raging between 10 and 40 feet in elevation. Water flows through three different basins in the watershed, each entering into different waterways at Port of Tacoma before flowing into Commencement Bay (Figure 4):

- The Lower Puyallup Basin drains the Puyallup River to the south of the project, into the Puyallup Waterway where it enters Commencement Bay.
- The Wapato Basin carries Wapato Creek to its confluence with the bay through Blair Waterway, with some water diverted into a ditch and draining to the Hylebos Waterway.
- The Hylebos Basin encompasses West Hylebos Creek, Hylebos Creek, and the Surprise Lake Tributary, carrying them to their outlet at Commencement Bay through the Hylebos Waterway.

The project corridor occurs in the flat, broad river valley in the lower watershed where soils formed on river deposited alluvium. The project crosses into areas of the cities of Puyallup, Fife, Milton, Edgewood, Tacoma and unincorporated Pierce County, where flat topography and alluvial soils support both agricultural lands as well as commercial, industrial, and residential developments.

Much of the land use activities influencing the surrounding landscape have resulted in alteration of vegetation, soils, and hydrology including many areas containing fill material and ditches draining water. Vegetation in the project vicinity is largely disturbed. Much of the southern project area is in agricultural production. Remaining vegetated open areas include uplands, wetlands, streams and riparian areas with native trees, shrubs, and herbaceous species, mixed with non-native and invasive species.

Rapid commercial development was present prior to the 2005 WDR conditions and has steadily continued over the past thirteen years. Many parcels in Fife near and adjacent to the proposed SR 167 Phase 1 Improvements were actively being developed during 2015 field work and as confirmed in 2017,

several parcels identified as potential wetland, stream, or riparian restoration in the 2005 WDR have since been developed.

Climate, Precipitation, and Growing Season

The SR 167 Completion Project study area is just above sea level and experiences the influencing climatic factors brought on by the Puget Sound. The lowland Puyallup River valley is characterized by a cool marine climate with cool, dry summers and wet, mild winters. The area receives an average total snow fall of less than seven inches per year and an overall total of 43 inches of precipitation per year with most of the precipitation occurring between September and June (NRCS 2017a).

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in *Engineering Field Handbook* (NRCS1997) to determine if precipitation occurring in the three full months prior to a site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. Drier than normal precipitation conditions characterize the entire growing season from March through September 2015, and were coupled with prolonged hot summer temperatures prior to field work occurring in fall 2015.

Ideally, in Western Washington, hydrology is assessed during the early growing season and during periods with normal precipitation conditions. When field work must be performed during periods considered drier than normal, biologists use best professional judgment based on field observations, combined with background information to make inferences about hydrology. During the 2015 field investigations, it was assumed that wetland hydrology is present during the growing season in years with normal precipitation, in areas where hydrophytic vegetation and landscape positions typical of wetlands were observed.

Wetlands

Overview

Fifty-three (53) wetlands were identified during the 2015 wetland inventory within the proposed SR 167 Phase 1 alignment (Wetland Summary Tables & Appendix B). This includes 35 wetlands previously identified in the 2005 WDR and eighteen (18) additional wetlands added during 2015 field work. Five wetlands were omitted that were previously included in the 2005 WDR. No wetlands were added or subtracted from the 2015 inventory based on the 2017 inventory. Two wetland boundaries (Wetland STW and Wetland Y) were modified in 2017.

Documented conditions of many wetlands identified in the 2005 WDR had little to no observable change during the 2015 wetland inventory field work. When changes to wetlands were evident, they included:

- Expanded wetland boundaries,
- A change in vegetation community; generally when agricultural fields were fallowed, vegetation reported as “palustrine unconsolidated shore” (PUS) in the 2005 WDR had changed to establishing “palustrine emergent” (PEM), “palustrine scrub-shrub” (PSS), or young “palustrine forested” (PFO) communities, and
- Additional wetlands previously unidentified; likely because they are either newly formed since the 2005 WDR, were not apparent at the time of the 2005 WDR study, or are newly added because they occurred beyond the 2006 FEIS alignment project limits.

Omitted wetlands either are no longer present due to development since 2005, or were determined to be non-jurisdictional by the USACE, Ecology, and local jurisdictions. Wetlands 10 and 12 were omitted because they were included in (had permitted impacts resulting) from the WSDOT I-5 HOV Port of Tacoma to King County Line project (USACE 2009) completed in May 2012.

Wetlands in the SR 167 Completion Project vicinity are depressional and/or riverine, with various Cowardin classes, wetland categories, and buffer widths (Table 2). Wetlands in active agricultural production were classified as PUS in the 2005 WDR and this designation of vegetation community is maintained in the 2015 wetland inventory when applicable (Figure 1a). Other wetlands with more typical vegetation communities were PEM, PSS, or PFO, or a combination of these Cowardin classes (Figures 1b and 2a). Wetlands along roadsides were typically riverine or depressional PEM wetlands (Figure 2b).

Pierce County and the five cities in which the project spans each use the Washington Wetland Rating System (Hruby 2004; Hruby 2014) to assess wetlands, and do not require additional county or city-specific assessments. All four wetland categories are present within the project study area. Most wetland categories for wetlands identified in the 2005 WDR remain unchanged, with the majority of wetlands in the project identified as Category III and preforming low to moderate water quality, hydrologic, and habitat functions. Three previously identified Category III wetlands on the southern portion of the project likely meet the requirements for mature forested Category I wetlands (B, P, and Q) and have been changed to reflect this observation. Wetlands B and P also contain wetland ditch areas and therefore are likely to have a dual rating of Category I/III assigned. Three wetlands were raised from Category III to Category II based on complexity of habitat, presence of Endangered Species Act (ESA) listed salmon in creeks within their boundaries, and significant size resulting in ability to perform high hydrologic functions (wetlands S/T/W, 9, and 13).

Wetlands in the project occur low in the lower Puyallup River watershed within three basins each draining to different waterways in Commencement Bay at Port of Tacoma. Surrounding land use is a mixed urban development including rural-residential, commercial and industrial, agricultural, vegetated open space, and transportation infrastructure. This landscape position and the surrounding land use conditions result in these wetlands providing important hydrologic and water quality functions in the watershed, likely improving conditions affecting Commencement Bay in Puget Sound. Several wetlands include creeks with ESA listed salmonids (WDFW 2017a) as well as other aquatic species, providing habitat for various fish and wildlife species.

1a



1b



Figure 1. 1a: wetland 2015-6, typical farmed wetland/PEM wetland. 1b: wetland LL extension where fallowed field reverts to naturally recruiting vegetation.



Figure 2. 2a: wetland BB PFO/PEM wetland along Hylebos Creek. 2b: wetland 8 typifies roadside wetlands along-I-5.

Wetland and Landscape Changes Since 2006

In general, vegetation, soil, and hydrology conditions within the SR 167 Completion Project vicinity have remained similar to 2005 WDR conditions which served as basis for the 2006 FEIS. Continued increase in commercial development in the lower Puyallup River Valley in areas adjacent to the proposed SR 167 Project's Phase 1 alignment has increased impervious surface, eliminating vegetated habitat and lands in historic or recent agricultural production. Conversion of lands adjacent to the Phase 1 alignment from open areas to impervious surface potentially affect hydrology within the alignment as well as surrounding areas.

In addition, several parcels acquired by WSDOT for the SR 167 Completion Project's Right of Way (ROW), in the City of Fife, were historically in farmer-owned agriculture, and are now owned by WSDOT and leased to various agriculture businesses. This transition may result in different land use practices potentially affecting hydrology on several farmed parcels in the ROW.

Table 2

Wetlands listed as they occur in the proposed SR 167 Completion Project Phase 1 alignment from south to north along the 167 extension corridor, and west to east along the existing SR 509 and I-5 corridors. Changes from 2005 to 2015 are bolded. All information is based on 2015 wetland inventory field work (and subsequent 2017 re-verification) and review of 2005 WDR documentation. Information may change following future wetland delineation and rating.

Wetland[a]	Local Jurisdiction	Wetland Classification				Wetland Size (acres) 2005	Wetland Size (acres) 2015	2015 Local Jurisdiction Buffer Width[d] (feet)
		Cowardin[b]	HGM	Ecology[c] & Local Rating[c] 2005	Ecology[c] & Local Rating[d] 2015			
wetlands along SR 167 Extension Corridor								
A	Pierce Co.	PUS	depressional	III	III	1.2	1.2	50
B	Pierce Co./ Puyallup	**PFO**/PEM/**PUS**	depressional	III	**I / III**	5.0	**12.13**	**150**
C	Puyallup	**PFO**	depressional	III	III	0.32	0.32	50
D	Pierce Co.	PUS	depressional	III	III	2.0	2.0	50
E	Pierce Co.	PUS	depressional	III	III	2.2	**2.01**	50
UU	Pierce Co.	PEM	riverine	II	II	2.3	**2.33**	100
V	Fife	PEM	riverine	II	II	0.68	**1.55**	100
2015 - 1	Fife	**PEM**	**depressional**	n/a	**III**	n/a	**0.39**	**50**
2015 - 2	Fife	**PFO**	**depressional**	n/a	**III**	n/a	**0.75**	**50**
2015 - 3	Fife	**PEM**	**depressional**	n/a	**III**	n/a	**0.11**	**50**
K	Fife	**PEM**	depressional	III	III	0.09	0.09	50
O	Fife	PUS	depressional	III	III	0.28	0.28	50
P	Fife	**PFO/PEM**	depressional	III	**I / III**	1.9	**2.82**	**150**
Q	Fife	PFO	depressional	III	**I**	1.2	1.2	**150**
2015 - 4	Fife	**PFO/PSS/PEM**	**depressional**	n/a	**III**	n/a	**6.29**	**50**
S/T/W	Fife	**PFO/PSS/PEM**	depressional/riverine	III	**II**	10.28	**24.83**	**100**
2015-5	Fife	**PSS/PEM**	**depressional**	n/a	**III**	n/a	**0.20**	**50**
Y	Fife	PUS	depressional	III	III	1.4	**1.96**	50
2015 - 6	Fife	**PEM/PUS**	**depressional**	n/a	**III**	n/a	**0.69**	**50**
2015 - 7	Fife	**PEM**	**riverine**	n/a	**IV**	n/a	**0.56**	**25**
2015 - 8	Fife	**PFO/PEM/PUS**	**depressional/riverine**	n/a	**III**	n/a	**7.26**	**50**
U	Fife	PUS	depressional	III	III	0.34	**0.35**	50
2015 - 9	Fife	**PEM/PUS**	**depressional/riverine**	n/a	**III**	n/a	**5.03**	**50**
2015 - 10	Fife	**PFO/PEM**	**depressional**	n/a	**III**	n/a	**0.78**	**50**

Footnotes:

Wetland identifier - wetland names retained from 2005 WDR, wetlands added to the inventory during 2015 field work have names with a 2015 prefix.

[b] NWI Class based on vegetation: PFO = palustrine forested, PSS = palustrine scrub-shrub, PEM = palustrine emergent, PUS = palustrine unconsolidated shore (for this project PUS = wetlands in active agricultural crop); (FGDC 2013).

[c] Ecology rating (Hruby2004; Hruby 2014). An "n/a" designation indicates the wetland was not identified in the 2005 WDR.[d] Category and buffer widths from appropriate local ordinances (Pierce County 2017; Tacoma 2017; Milton 2017; Fife 2017; Puyallup 2017). An "n/a" indicates the wetland was previously unidentified in the 2005 WDR. All buffer information is subject to change following future wetland rating.

Table 2 (continued…)

Wetland[a]	Local Jurisdiction	Wetland Classification				Wetland Size (acres) 2006	Wetland Size (acres) 2015	2015 Local Jurisdiction Buffer Width[d] (feet)
		Cowardin[b]	HGM	Ecology[c] & Local Rating[c] 2005	Ecology[c] & Local Rating[d] 2015			
wetlands along SR 167 Extension Corridor continued								
2015-17	Fife	**PFO/PSS**	depressional	n/a	**III**	n/a	**0.54**	**50**
2015-18	Fife	**PFO/PEM**	depressional	n/a	**III**	n/a	**0.86**	**50**
AA	Pierce Co.	**PFO/PEM**	depressional	III	III	0.57	0.57	50
BB	Pierce Co./ Fife	**PFO**	riverine	II	II	0.84	0.84	100
CC	Pierce Co.	**PFO**/PEM	riverine	III	III	0.13	**0.52**	50
DD	Pierce Co.	PEM	depressional	III	III	0.66	0.66	50
EE	Fife	**PFO/PEM**	depressional	III	III	0.12	**0.37**	50
GG	Fife	**PFO**	depressional	III	III	1.8	1.80	50
HH	Fife	**PFO/PEM**	depressional	III	III	1.5	1.51	50
LL	Fife	PFO	depressional	III	III	1.2	**2.02**	50
wetlands along existing SR 509 Corridor								
2015-13	Fife	**PFO**	**riverine**	n/a	**III**	n/a	**1.25**	**50**
wetlands along existing I-5 Corridor								
2015-14	Fife	**PEM**	**depressional**	n/a	**III**	n/a	**0.30**	**50**
2015-15	Fife	**PFO/PEM**	**depressional**	n/a	**III**	n/a	**0.74**	**50**
1	Fife	PEM	riverine	III	III	3.2	3.20	50
2	Fife	PEM	depressional	III	III	1.2	**1.25**	50
3	Fife	PEM	depressional	III	III	1.6	1.60	50
4	Fife	**PSS**/PEM	riverine	III	III	1.5	1.50	50
5	Pierce Co.	PEM	riverine	III	III	0.35	0.35	50
2015 - 11	Pierce Co.	**PFO**	**riverine**	n/a	**III**	n/a	**0.07**	**50**
2015 - 12	Pierce Co.	**PEM**	**depressional**	n/a	**III**	n/a	**0.09**	**50**
6	Fife	PEM	riverine	III	III	1.3	1.30	50
7	Pierce Co.	PEM	riverine	III	III	0.49	**0.92**	50
8	Pierce Co./ Milton	**PFO/**PEM	**depressional**/riverine	III	III	0.49	**2.36**	50/105
9	Pierce Co./ Milton	**PFO**/PSS/PEM	depressional/riverine	III	**II**	50+	66.56	100/165
2015-16	Milton	**PFO/PEM**	**depressional**	n/a	**II**	n/a	**4.46**	**165**
11	Milton	**PFO**/PSS	depressional/riverine	II	II	1.3	**3.89**	165
13	Milton	PSS/PEM	depressional/riverine	III	**II**	2.22	**8.17**	**165**
14	Milton	**PSS**	depressional	III	III	0.92	0.92	60
15	Milton	PSS/PEM	depressional	III	III	0.14	0.14	60

Vegetation, Hydrology, and Soils Changes

Vegetation for the majority of the wetlands in the project remains similar to conditions documented in the 2005 WDR, and described in the 2006 FEIS. Typical vegetation includes native trees and shrubs with a mix of native, non-native, and invasive herbaceous vegetation, as well as several wetlands planted in agricultural crops.
When vegetation changes were observed between 2005 WDR and 2015 wetland inventory conditions, they mainly occurred in fallowed agricultural lands of the project in Fife. When fields in this area are fallowed, native tree saplings and shrubs, along with common pasture grasses, and herbaceous and invasive species establish on previously farmed land (Figure 3a).

Localized hydrologic inputs in the surrounding areas may have changed since 2005 WDR conditions, as more impervious surfaces increase run-off, diminish groundwater recharge in some areas, while increasing point source inputs from stormwater infrastructure and impervious surfaces in other locations (Figure 3b). In addition, several agricultural parcels in WSDOT ownership within the proposed refined alignment ROW are leased to agricultural businesses, and now may be managed differently from historically farmer-owned land management practices. Operators of agricultural practices on leased parcels may be less active in managing drainage ditches and surface water drainage systems.

Soils in the proposed SR 167 Phase 1 alignment are generally loamy mineral soils, and several are hydric soils in Washington State, including two different muck soils (Appendix A-2; NRCS 2017b; NRCS 2017d). The predominant soil in the alignment remains Sultan silt loam, which is not a hydric soil in Washington. This fine textured soil is moderately well drained (NRCS 2017c) and capable of water retention for prolonged periods, especially in areas with relatively flat topography. Many soils in and adjacent to the proposed SR 167 Phase 1 alignment have experienced recent or ongoing disturbance since 2006 including land clearing and grading activities, recent conversion to commercial developments, as well as ongoing soil disturbances associated with the agricultural practices.

Added Wetlands on Agricultural Lands and Extended Wetland Boundaries

When wetlands were added or wetland boundaries extended during the 2015 wetland inventory, it was often due to a combination of the changing conditions of the three wetland factors discussed above. Newly forming wetland conditions sometimes occur in the 2015 (re-verified in 2017) inventory when:

- Naturally recruiting vegetation colonizes a fallowed field,
- Hydrologic inputs increase or maintain in areas with soil disturbances,
- Drainage systems are not meticulously managed in areas with fine-textured soils where drainage is poor to moderate.

(Examples include wetlands: 2015-4, 2015-6, 2015-8, 2015-9, and extensions of wetland boundaries in S/T/W, Y, EE and LL).



Figure 3. 3a: fallowed agricultural field with various stages of colonizing vegetation in wetland 2015-4; 3b: stormwater pond discharge point into wetland P from new development adjacent to the proposed SR 167 Phase 1 alignment.

Wetland Summary Tables

The following wetland summary tables provide information regarding each of the 53 wetlands identified within the proposed SR 167 Phase 1 alignment. Aerial photos are provided, including a sketch of wetland boundaries where red polygons indicate wetland boundaries previously identified in the 2005 WDR, and blue polygons indicate additional potential wetland boundaries identified during the 2015 wetland inventory. Yellow polygons show wetlands previously identified in the 2005 WDR occurring in problematic wetland situations on agricultural lands. Yellow agricultural wetland boundaries were assumed to remain present during the 2015 wetland inventory and will need further examination during future delineation prior to SR 167 Completion Project permitting.

When the wetland summary tables reference 2005 WDR conditions, the referenced wetland descriptions can be reviewed in the 2005 WDR (WSDOT 2005).

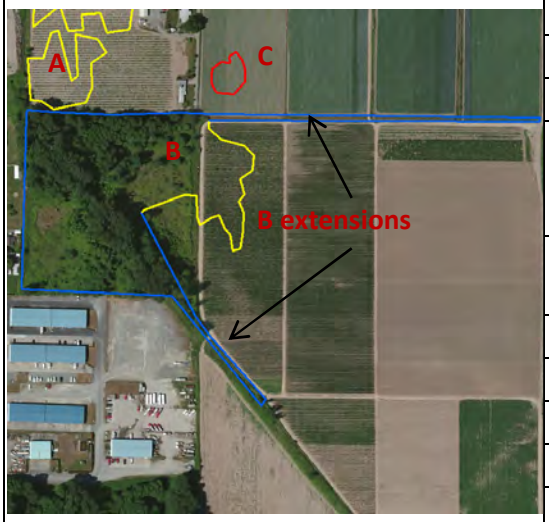
WETLAND A – INFORMATION SUMMARY	
Wetland previously identified as Wetland A in the 2005 WDR. Wetland A is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland A remains in agricultural use in 2017. Wetland A occurs southwest of the proposed SR 167 Phase 1 alignment with its buffer extending into the proposed alignment.	
Location:	Section 17, Township 20N, Rage 4E
	Unincorporated Pierce County
	South of Valley Ave E., north of North Levee Road E., east of Freeman Road E., west of 86th Ave E.



Local Jurisdiction	Pierce County
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Pierce Co. Buffer	50 feet
2005 Wetland Size	1.2 acres
2017 Anticipated Wetland Size	1.2 acres
2005 Cowardin Classification	PUS
2017 Cowardin Classification	PUS
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: active, planted, commercial agricultural vegetable crops.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.

WETLAND B – INFORMATION SUMMARY		
Wetland B likely increased from Category III, identified in 2005 WDR, to Category I in the 2015 wetland inventory due to special characteristics as mature forested wetland. This wetland may potentially be assigned a dual rating Category I/Category III. In addition to the change of an added forested component, overall wetland area increased to include two wetland ditches to the northeast and southeast (blue areas in photo).		
Location:	Sections 20 and 21, Township 20N, Rage 4E	
	Unincorporated Pierce County/City of Puyallup	
	South of Valley Ave E., north of North Levee Road E., east of Freeman Road E.	



Local Jurisdiction	Pierce County/Puyallup
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	Potential dual rating Cat I (mature forest)/ Cat III (based on functions)
2017 Anticipated Pierce Co./ Puyallup Buffer	150
2005 Wetland Size	5.0 acres
2017 Anticipated Wetland Size	12.13 acres
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PFO/PEM/PUS
HGM Classification	Depressional

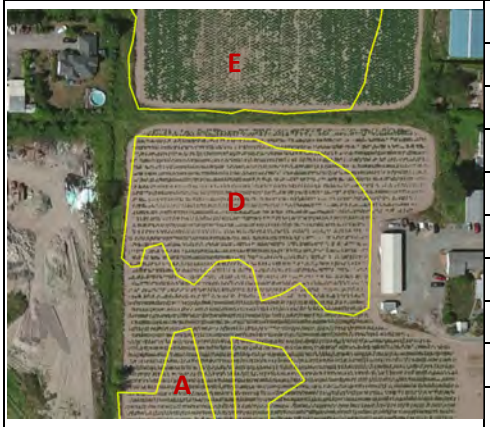
Wetland Characteristics	
Dominant Vegetation	Dominant vegetation appears to remain the same as what was documented in the 2005 WDR, with black cottonwood (*Populus balsamifera*) and Oregon ash (*Fraxinus latifolia*) providing the dominant overstory cover and Himalayan blackberry (*Rubus armeniacus*), red osier dogwood (*Cornus alba*), and snowberry (*Symphoricarpos albus*) in the understory. Additional wetland areas added in 2015 include berry plants and mowed herbaceous vegetation in agricultural wetland ditches – mowed grass, likely FAC or wetter (growing in flowing water during dry season)
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation. In addition, 2015 observations suggest seasonal ponding is also likely.
Wetland Rating/ Functions	Wetland may be assigned a dual rating for Category I mature forested/Category III based on functions. Anticipated change from Category III, see 2005 WDR, to Category I in 2017 based on special characteristics for mature forested wetlands in the northwest portion of the wetland. Some black cottonwood trees in northwest corner of wetland meet/exceed 21 inches diameter at breast height (dbh). Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions. In addition, 2017 observations suggest habitat functions are also provided at a moderate to high level in mature forested areas in the northwest portion of the wetland.

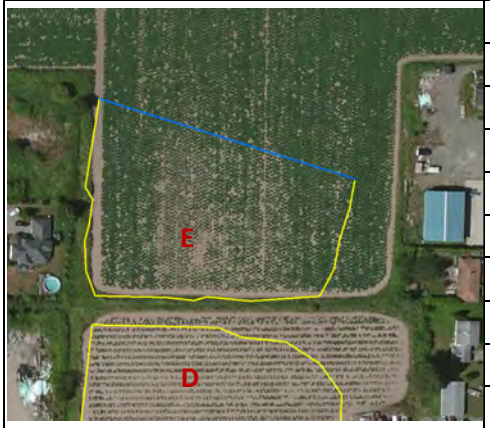
WETLAND C – INFORMATION SUMMARY	
Wetland previously identified as Wetland C in the 2005 WDR. Wetland C is assumed to remain present, with boundaries unchanged, however conditions have changed since the 2005 WDR, which indicate the wetland was in active cultivation. Wetland C has been fallow for enough time to allow a PFO community dominated by approximately 25-foot tall black cottonwood saplings to establish. Land adjacent to the east was apparently in agricultural production during the 2005 WDR, and now has been converted to commercial land use with a stormwater pond between the wetland to the east and the impervious surfaces surrounding the commercial development east of the stormwater pond (historic land use shown in photo).	
Location:	Section 16, Township 20N, Rage 4E
	City of Puyallup
	South of Valley Ave E., north of North Levee Road E., east of of 86th Ave E., west of Valley Ave NW.



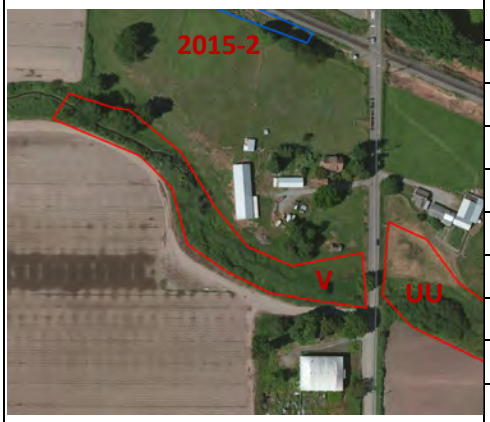
Local Jurisdiction	Puyallup
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Puyallup Buffer	50
2005 Wetland Size	0.32 acre
2017 Anticipated Wetland Size	0.32 acre
2005 Cowardin Classification	PUS
2017 Cowardin Classification	PFO
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Wetland C vegetation conditions have changed from active agricultural production identified in the 2005 WDR to fallowed conditions in 2017, allowing black cottonwood saplings to colonize the wetland. Red osier dogwood, Himalayan blackberry, and a mixed herbaceous community are present in the understory.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions. Habitat functions may have increased in 2017 from 2005 WDR conditions, as the vegetation community has changed from agricultural crop to native dominated palustrine forested community.

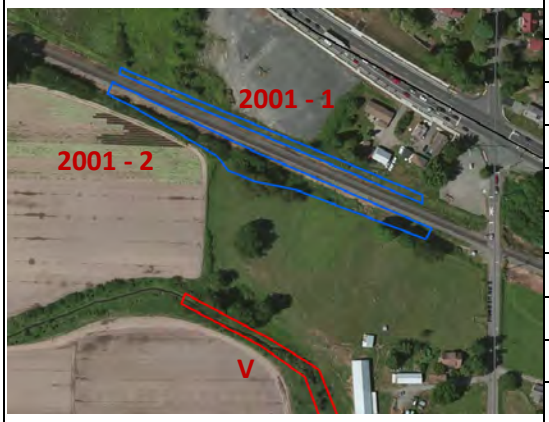
WETLAND D – INFORMATION SUMMARY		
Wetland previously identified as Wetland D in the 2005 WDR. Wetland D is assumed to remain present and in similar condition as documented in 2005 WDR. Wetland D remains in agricultural use in 2017.		
Location:	Section 17, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	South of Valley Ave E., north of North Levee Road E., east of Freeman Road E., west of 86th Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	2.0 acres
	2017 Anticipated Wetland Size	2.0 acres
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PUS
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: active, planted, commercial agricultural vegetable crops.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND E – INFORMATION SUMMARY		
Wetland previously identified as Wetland E in the 2005 WDR. Wetland E is assumed to remain present and in similar condition as documented in 2005 WDR. Wetland E remains in agricultural use in 2017. Land adjacent to the north was apparently in agricultural production during the 2005 WDR, and now has been converted to commercial land use with fill material being added along approximate northern blue wetland boundary (historic land use shown in photo).		
Location:	Section 17, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	South of Valley Ave E., north of North Levee Road E., east of Freeman Road E., west of 86th Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	2.2 acres
	2017 Anticipated Wetland Size	2.01 acres
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PUS
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: active, planted, commercial agricultural vegetable crops.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND UU – INFORMATION SUMMARY		
Wetland previously identified as Wetland UU in the 2005 WDR. Wetland UU is assumed to remain present and in similar condition as documented in 2005 WDR. Wetland UU remains a riverine wetland associated with Wapato Creek in 2017.		
Location:	Section 17, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	South of Valley Ave E., north of North Levee Road E., east of Freeman Road E., west of 86th Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	II
	2017 Anticipated Rating	II
	2017 Anticipated Pierce Co. Buffer	100
	2005 Wetland Size	2.3 acres
	2017 Anticipated Wetland Size	2.33 acres
	2005 Cowardin Classification	PEM
	2017 Cowardin Classification	PEM
	HGM Classification	Riverine
Wetland Characteristics		
Dominant Vegetation	Wetland UU identified in 2005 WDR was a riverine wetland dominated by reed canarygrass (*Phalaris arundinacea*), and soft rush (*Juncus effusus*) with scattered native shrubs. Vegetation conditions remain unchanged in 2015.	
Mapped Soils	Sultan silt loam and Puyallup fine sandy loam. Mapped soils are not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal flooding and high ground water table associated with perennial flows in Wapato Creek.	
Wetland Rating/ Functions	Category II Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions. Documentation of habitat functions may be upgraded in 2017 from 2005 WDR conditions, as ESA listed salmonids are present in the reach of Wapato Creek flowing through Wetland UU (WDFW 2017a).	

WETLAND V – INFORMATION SUMMARY		
Wetland previously identified as Wetland V in the 2005 WDR. Wetland V is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland V remains a riverine wetland associated with Wapato Creek in 2017.		
Location:	Section 17, Township 20N, Rage 4E	
	City of Fife	
	South of Valley Ave E., north of 48th St E., east of 70th Ave E., west of Freeman Road E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	II
	2017 Anticipated Rating	II
	2017 Anticipated Fife Buffer	100
	2005 Wetland Size	0.68 acre
	2017 Anticipated Wetland Size	1.55 acre
	2005 Cowardin Classification	PEM
	2017 Cowardin Classification	PEM
	HGM Classification	Riverine
Wetland Characteristics		
Dominant Vegetation	Wetland V identified in 2005 WDR was a riverine wetland dominated by reed canarygrass, and soft rush with scattered native shrubs. Vegetation conditions remain unchanged in 2017.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal flooding and high ground water table associated with perennial flows in Wapato Creek.	
Wetland Rating/ Functions	Category II Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions. Documentation of habitat functions may be upgraded in 2017 from 2005 WDR conditions, as ESA listed salmonids are present in the reach of Wapato Creek flowing through Wetland V (WDFW 2017a).	

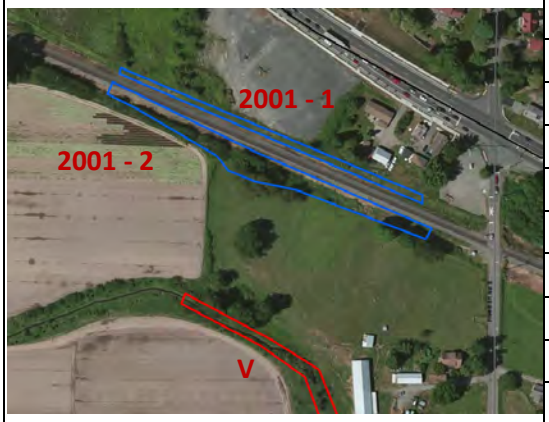
WETLAND 2015 - 1 – INFORMATION SUMMARY	
Wetland 2015 - 1 is a newly added wetland. It occurred within the 2006 FEIS alignment, but was not identified in the 2005 WDR. It is a wetland ditch bordered by the railroad prism to the southwest and a combination of vegetated open area, fill material, and residential areas to the northeast. The wetland boundary may extend beyond the proposed refined alignment.	
Location:	Section 17, Township 20N, Rage 4E
	City of Fife
	South of Valley Ave E., north of 48th St E., east of 70th Ave E., west of Freeman Road E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.39 acre
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PEM
HGM Classification	Depressional

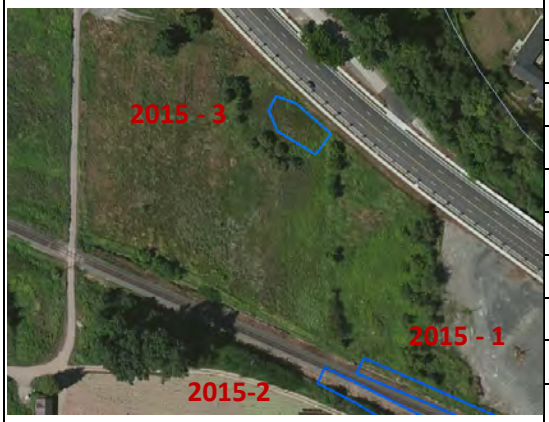
Wetland Characteristics	
Dominant Vegetation	Dominant vegetation is reed canarygrass.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is a presumed high groundwater table with secondary inputs from runoff from surrounding areas. Hydroperiods likely include seasonal ponding and seasonal saturation.
Wetland Rating/ Functions	Assumed Category III. Primary functions likely include: moderate water quality and hydrologic functions and low habitat functions.

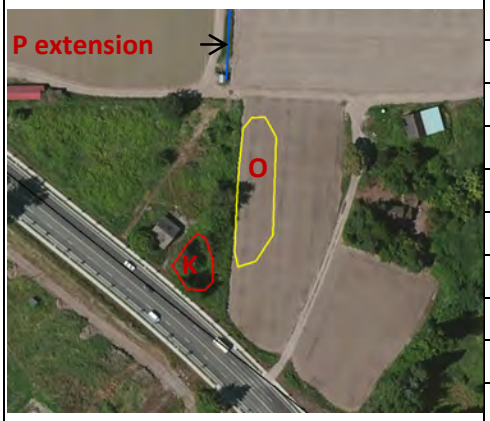
WETLAND 2015 - 2 – INFORMATION SUMMARY	
Wetland 2015 - 2 is a newly added wetland. It occurred within the 2006 FEIS alignment, but was not identified in the 2005 WDR. It is a wetland ditch bordered by the railroad prism to the northeast and a combination of agricultural fields and rural residential areas to the southwest. The wetland boundary likely extends beyond the proposed refined alignment to the west.	
Location:	Section 17, Township 20N, Rage 4E
	City of Fife
	South of Valley Ave E., north of 48th St E., east of 70th Ave E., west of Freeman Road E.

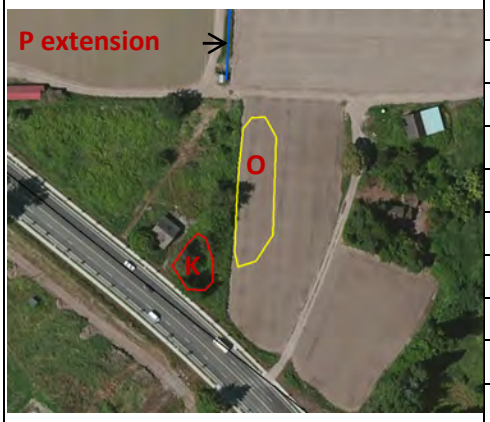


Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.75 acre
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO
HGM Classification	Depressional

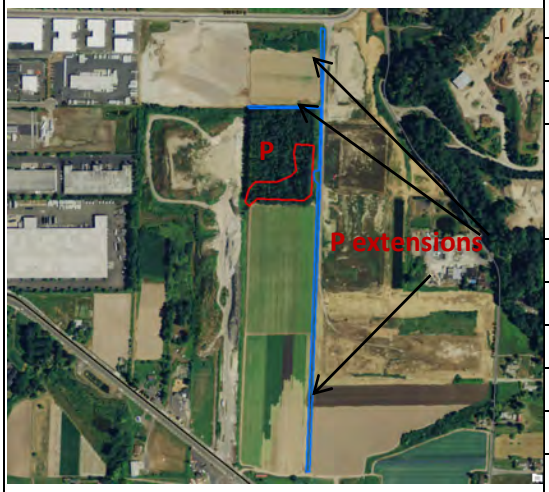
Wetland Characteristics	
Dominant Vegetation	Dominant vegetation willows (*Salix spp.*) with reed canarygrass in the understory.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is a presumed high groundwater table with secondary inputs from runoff from surrounding areas. Hydroperiods likely include seasonal ponding and seasonal saturation.
Wetland Rating/ Functions	Assumed Category III. Primary functions likely include: moderate water quality and hydrologic functions and low habitat functions.

WETLAND 2015 - 3 – INFORMATION SUMMARY			
Wetland 2015 - 3 is a newly added wetland not identified in the 2005 WDR. It appears to occur just beyond the 2006 FEIS alignment. It is a wetland that has developed in a small depression in an area potentially containing fill.			
Location:	Section 17, Township 20N, Rage 4E		
	City of Fife		
	South of Valley Ave E., north of 48th St E., east of 70th Ave E., west of Freeman Road E.		
		**Local Jurisdiction**	Fife
		WRIA	Puyallup – White 10
		2005 Ecology & Local Rating	n/a
		2017 Anticipated Rating	III
		2017 Anticipated Fife Buffer	50 feet
		2005 Wetland Size	n/a
		2017 Anticipated Wetland Size	0.11 acre
		2005 Cowardin Classification	n/a
		2017 Cowardin Classification	PEM
		HGM Classification	Depressional
Wetland Characteristics			
Dominant Vegetation	Dominant vegetation is reed canarygrass with scattered Himalayan blackberry.		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Predominant hydrology source is assumed to come as sheet flow following precipitation events from surrounding upland areas with compacted soil or impervious surfaces. Hydroperiods likely include seasonal ponding and seasonal saturation.		
Wetland Rating/ Functions	Assumed Category III. Primary functions likely include: moderate water quality and hydrologic functions and low habitat functions.		

WETLAND K – INFORMATION SUMMARY		
Wetland previously identified as Wetland K in the 2005 WDR. Wetland K is assumed to remain present and in similar condition as documented in the 2005 WDR, however fallowed conditions have converted the previously documented PUS community to PEM conditions observed in 2017.		
Location:	Section 17, Township 20N, Rage 4E	
	City of Fife	
	South of 26th St E., north of. Valley Ave E., east of 70th Ave E., west of Freeman Road E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	0.09 acre
	2017 Anticipated Wetland Size	0.09 acre
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Vegetation has changed from 2005 WDR conditions from fallowed agricultural field to PEM community dominated by reed canarygrass with scattered Himalayan blackberry intermixed.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND O – INFORMATION SUMMARY		
Wetland previously identified as Wetland O in the 2005 WDR. Wetland O is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland O remains in agricultural use in 2017.		
Location:	Section 17, Township 20N, Rage 4E	
	City of Fife	
	South of 26th St E., north of. Valley Ave E., east of 70th Ave E., west of Freeman Road E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	0.28 acre
	2017 Anticipated Wetland Size	0.28 acre
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PUS
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: recently fallowed field with reed canarygrass and fringed willowherb (*Epilobium ciliatum*) establishing.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.	

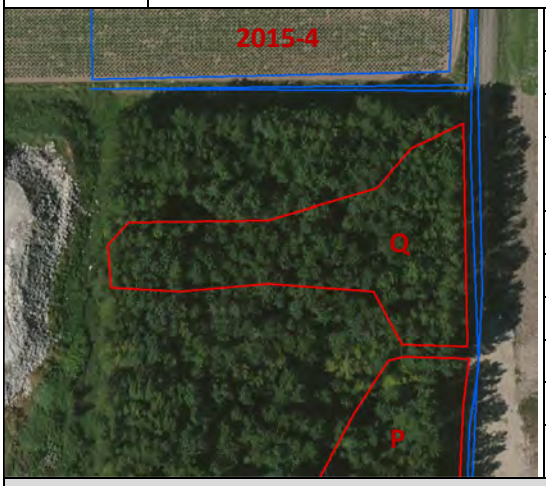
WETLAND P – INFORMATION SUMMARY	
Wetland P increased from Category III, identified in the 2005 WDR, to Category I in 2015 wetland inventory due to special characteristics as mature forested wetland. This wetland may potentially be assigned a dual rating Category I/Category III for the PFO and PEM sections. In addition to the change of a mature forested component, overall wetland area increased to include two wetland ditches to the north and west of Wetlands P and Q, potentially carrying water from a reach of the Surprise Lake Tributary (blue areas in photo).	
Location:	Sections 8 and 17, Township 20N, Rage 4E
	City of Fife
	South of 26th St E., north of Valley Ave E., west of Freeman Road E., east of 70th Ave E



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	potential dual rating Cat I (mature forest)/ Cat III (based on functions)
2017 Anticipated Fife Buffer	150 feet
2005 Wetland Size	1.9 acres
2017 Anticipated Wetland Size	2.82 acres
2005 Cowardin Classification	PFO
2017 Cowardin Classification	PFO/PEM
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Dominant vegetation appears to remain the same as what was documented in the 2005 WDR, with black cottonwood providing the dominant overstory cover and red osier dogwood, Himalayan blackberry, and snowberry in the understory. Additional wetland areas added in 2015 include wetland ditches dominated by reed canarygrass.
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Briscot loam which is a hydric soil.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation from precipitation accumulation on fine textured soils. Newly added wetland ditch areas convey groundwater and runoff including some water draining from the Surprise Lake Tributary, flowing from the north out of Wetland S/T/W.
Wetland Rating/ Functions	Wetland may be assigned a dual rating for Category I mature forested/Category III based on functions. Anticipated change from Category III, see 2005 WDR, to Category I in 2017 based on special characteristics for mature forested wetlands in the PFO portion of the wetland. Some black cottonwood trees meet/exceed 21 inches dbh. Some primary functions remain unchanged from 2005 WDR conditions including high water quality and hydrologic functions, however the parcel was purchased in 2004 by WSDOT in anticipation of the proposed refined alignment, eliminating educational or scientific functions.

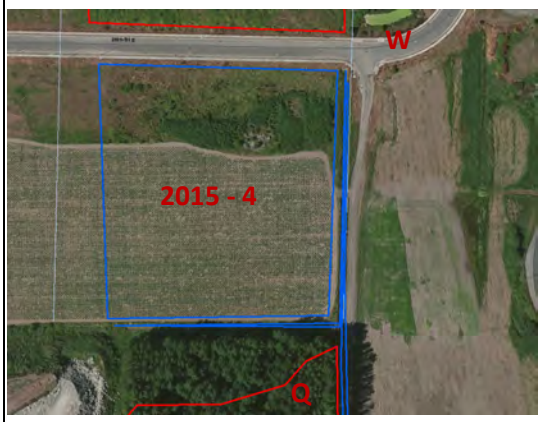
WETLAND Q – INFORMATION SUMMARY	
Wetland Q increased from Category III, identified in the 2005 WDR, to Category I in 2015 wetland inventory due to special characteristics as mature forested wetland. Wetland boundaries are assumed to remain unchanged.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of 26th St E., north of Valley Ave E., west of Freeman Road E., east of 70th Ave E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	I (special characteristic for mature forest)
2017 Anticipated Fife Buffer	150 feet
2005 Wetland Size	1.2 acres
2017 Anticipated Wetland Size	1.2 acres
2005 Cowardin Classification	PFO
2017 Cowardin Classification	PFO
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Dominant vegetation appears to remain the same as 2005 WDR conditions, with black cottonwood providing the dominant overstory cover and red osier dogwood, Himalayan blackberry, and snowberry in the understory.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation from precipitation accumulation on fine textured soils.
Wetland Rating/ Functions	Anticipated change from Category III, see 2005 WDR, to Category I in 2017 based on special characteristics for mature forested wetlands. Some black cottonwood trees meet/exceed 21 inches dbh. Some primary functions remain unchanged from 2005 WDR conditions including high water quality and hydrologic functions, however the parcel was purchased in 2004 by WSDOT in anticipation of the proposed 2006 FEIS alignment, eliminating educational or scientific functions.

WETLAND 2015 - 4 – INFORMATION SUMMARY	
Wetland 2015 - 4 is a newly added wetland not identified in the 2005 WDR. It occurred within the 2006 FEIS alignment, but was not identified in the 2005 WDR likely because it was in active cultivation and apparently did not exhibit wetland characteristics at the time. Conditions have changed since the 2005 WDR conditions. This area has been fallow for enough time to allow a young PFO/PSS/PEM community to develop in areas with wetland hydrology indicators.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of 26th St E., north of Valley Ave E., west of Freeman Road E., east of 70th Ave E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	6.29 acres
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO/PSS/PEM
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Vegetation has converted from areas previously identified as upland in agricultural production, to native and non-native wetland vegetation. Several areas documented as PEM in 2015 will likely turn into PSS over time as many native woody seedlings had germinated over the 2015 growing season. PFO - Dominant vegetation is young black cottonwood and Sitka willow (*Salix sitchensis*), to about 30 feet high, with red osier dogwood and hardhack (*Spiraea douglasii*) in the understory PSS – dominated by young black cottonwood PEM – dominated by clovers (*Trifolium spp.*), common plantain (*Plantago major*), colonial bentgrass (*Agrostis capillaris),* fringed willowherb, reed canarygrass (*Phalaris arundinacea*) perennial ryegrass (*Lolium perenne*), and cudweeds (*Gnaphalium spp.*)
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils. A high ground water table may also be present.
Wetland Rating/ Functions	Assumed Category III. Primary functions likely include: moderate water quality, hydrologic, and habitat functions.

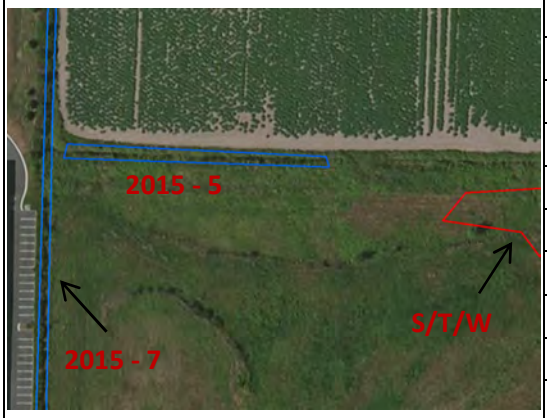
WETLAND S/T/W – INFORMATION SUMMARY	
Wetlands identified in the 2005 WDR as S, T, and W likely comprise one large wetland including multiple reaches of the Surprise Lake Tributary drainage system. Wetland W was west of Wetland S in 2005 and has been totally impacted by development. Areas between and near wetlands S and T appear to meet wetland criteria in 2015 (blue areas in photo). For these reasons, wetlands S and T have been combined into one single wetland with areas extending beyond the proposed SR 167 Phase 1 alignment. Because this is a very large wetland containing previously farmed fields that have converted to native and non-native vegetation, including multiple Cowardin classes and several reaches of the Surprise Lake Tributary, the three wetlands that were each documented as Category III are now anticipated to be Category II. Land directly to the west of S/T/W was actively being converted from fallowed agricultural field to commercial development in 2015. By 2017, Wetland W did not exist due to development and is excluded from the wetland polygon below. Also noted during the 2017 visit were excavation and filling activities on the southeast portion of STW. A portion of STW has been trimmed out of the wetland polygon where a stormwater pond has been constructed.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of 20th St E., north of 26th St. E., west of Freeman Road E., east of 70th Ave E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	II
2017 Anticipated Fife Buffer	100 feet
2005 Wetland Size	10.28 acres (0.78 ac S, 8.2 ac T, 1.3 ac W)
2017 Anticipated Wetland Size	24.83 acres (estimated in 2017)
2005 Cowardin Classification	PUS
2017 Cowardin Classification	PFO/PSS/PEM
HGM Classification	Depressional/riverine

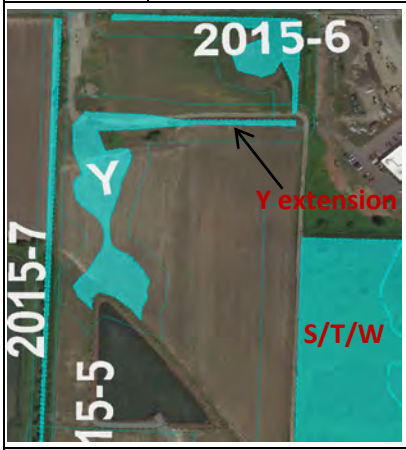
Wetland Characteristics	
Dominant Vegetation	Vegetation has converted from upland and wetland areas in agricultural production to native and non-native wetland vegetation. PFO – dominated by Sitka willow, Pacific willow, and black cottonwood PSS dominated by red osier dogwood, with scattered hardhack and Himalayan blackberry PEM - monoculture of reed canarygrass
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Shalcar muck and Semiahmoo muck which are both hydric soils.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils, a high water table and surface and subsurface flows from the Surprise Lake Tributary.
Wetland Rating/ Functions	Anticipated change from Category III to Category II in 2017 based on the conversion of crop vegetation to three Cowardin classes and several reaches of the Surprise Lake Tributary now included in the wetland boundary as opposed to outside of the wetland boundary. Many primary functions remain unchanged from 2005 WDR conditions including high water quality and hydrologic functions. An increase in habitat functions was observed as crop vegetation has developed into three Cowardin classes and the the wetland boundary now includes the Surprise Lake Tributary.

WETLAND 2015 - 5 – INFORMATION SUMMARY	
Wetland 2015 - 5 is a newly added wetland not identified in the 2005 WDR. It occurs just beyond the 2006 FEIS alignment and the proposed SR 167 Phase 1 alignment. This wetland was documented in the 2015 wetland inventory because of its proximity to the alignment. This wetland is just south of a field in active agricultural production and north of a property that was actively being developed in 2015, and had been developed by 2017.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of 20th St E., north of 26th St. E., west of Freeman Road E., east of 70th Ave E.



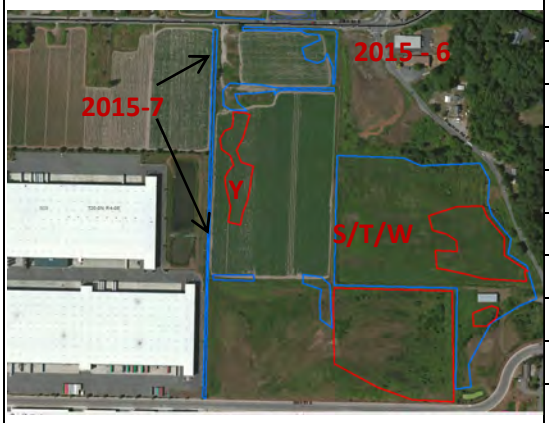
Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.20 acre
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PSS/PEM
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Dominant vegetation is red osier dogwood, hardhack, black cottonwood saplings and young willows. Reed canarygrass, common velvetgrass (*Holcus lanatus*), and colonial bentgrass dominate the herbaceous community.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table.
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality and hydrologic functions and low habitat functions.

WETLAND Y – INFORMATION SUMMARY			
Wetland previously identified as Wetland Y in the 2005 WDR. Wetland Y is assumed to remain present and in similar condition as documented in 2005 WDR. Wetland Y remains in agricultural use in 2015. Overall wetland area increased to include a wetland ditch flowing along the northeastern edge of the wetland (blue areas in photo). A portion of the southwestern boundary extends beyond the proposed SR 167 Phase 1 alignment. In 2017 a small portion of the Wetland Y qualitative polygon was trimmed off the southern end of Wetland Y.			
Location:	Section 8, Township 20N, Rage 4E		
	City of Fife		
	South of 20th St E., north of 26th St. E., west of Freeman Road E., east of 70th Ave E.		
		**Local Jurisdiction**	Fife
		WRIA	Puyallup – White 10
		2005 Ecology & Local Rating	III
		2017 Anticipated Rating	III
		2017 Anticipated Fife Buffer	50 feet
		2005 Wetland Size	1.4 acres
		2017 Anticipated Wetland Size	1.96 acres
		2005 Cowardin Classification	PUS
		2017 Cowardin Classification	PUS
		HGM Classification	Depressional
Wetland Characteristics			
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: active, planted, commercial agricultural vegetable crops.		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.		
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.		

WETLAND 2015 - 6 – INFORMATION SUMMARY			
Wetland 2015 - 6 is a newly added wetland which includes the northeast corner of an agricultural field not in cultivation, a portion of the field in active agricultural cultivation, and a wetland ditch conveying a reach of the Surprise Lake Tributary. It appears to occur beyond the 2006 FEIS alignment and only a portion of the wetland ditch enters the proposed SR 167 Phase 1 alignment.			
Location:	Section 8, Township 20N, Rage 4E		
	City of Fife		
	South of 20th St E., north of 26th St. E., west of Freeman Road E., east of 70th Ave E.		
	**Local Jurisdiction**	Fife	
	WRIA	Puyallup – White 10	
	2005 Ecology & Local Rating	n/a	
	2017 Anticipated Rating	III	
	2017 Anticipated Fife Buffer	50 feet	
	2005 Wetland Size	n/a	
	2017 Anticipated Wetland Size	0.69 acre	
	2005 Cowardin Classification	n/a	
	2017 Cowardin Classification	PEM/PUS	
	HGM Classification	Depressional	
Wetland Characteristics			
Dominant Vegetation	PEM areas are dominated by reed canarygrass with broadleaf cattail (*Typha latifolia*) PUS areas are in active agricultural crop production		
Mapped Soils	Shalcar muck. Mapped soil is hydric.		
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table. In addition, the Surprise Lake Tributary reach flowing through the wetland ditch carries perennial stream flows.		
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality and hydrologic functions, and low habitat functions.		

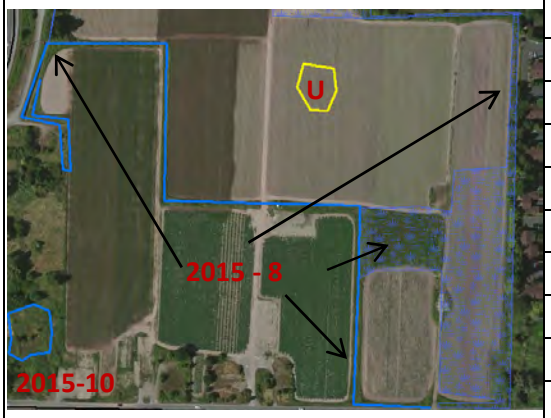
WETLAND 2015 - 7 – INFORMATION SUMMARY	
Wetland 2015 - 7 is a newly added wetland ditch conveying a reach of the Surprise Lake Tributary. A portion of this wetland appears to occur within the 2006 FEIS alignment. This wetland is between fields in active agricultural production on the northern extent, and between commercial property and a property that was actively being developed during the 2015 field visit on the southern extent. Portions of wetland 2015 – 7 extend beyond the proposed SR 167 Phase 1 alignment.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of 20th St E., north of 26th St. E., west of Freeman Road E., east of 70th Ave E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	IV
2017 Anticipated Fife Buffer	25 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.56 acre
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PEM
HGM Classification	Riverine

Wetland Characteristics	
Dominant Vegetation	Dominant vegetation is reed canarygrass and fringed willowherb. Common duckweed (*Lemna minor*) is present in areas with flowing water.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is presumed perennial stream flows contributed from the Surprise Lake Tributary reach flowing through the wetland ditch.
Wetland Rating/ Functions	Assumed Category IV Primary functions include low water quality, hydrologic functions. Habitat functions are moderate due to the presence of ESA listed salmonids this reach of Surprise Lake Tributary (WDFW 2017a).

WETLAND 2015 - 8 – INFORMATION SUMMARY	
Wetland 2015 - 8 is a newly added wetland not identified in the 2005 WDR. It occurs beyond the 2006 FEIS alignment and within the proposed SR 167 Phase 1 alignment. This wetland includes an area that was historically in cultivation which has been fallow for enough time to allow a young PFO community to develop, wetland areas in active cultivation, and a riverine section conveying a reach of the Surprise Lake Tributary. The riverine portion of the wetland flows briefly into the riverine section of wetland 2015 – 9 before crossing I-5 where it joins Hylebos Creek.	
Location:	Section 8, Township 20N, Rage 4E
	City of Fife
	South of I-5 and the Interurban Trail., north of 20th St E., west of Milton Way, east of 70th Ave E.

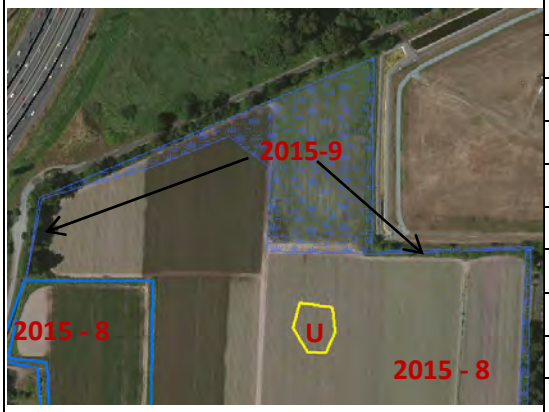


Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	7.26 acres (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO/PEM/PUS
HGM Classification	Depressional/Riverine

Wetland Characteristics	
Dominant Vegetation	PFO areas are dominated by young black cottonwood to about 30 feet high. This portion of the wetland has vegetation that has established on a fallowed agricultural field with reed canarygrass and rushes (*Juncus spp.*) PEM areas are dominated by reed canarygrass and broadleaf cattail and occur in the wetland ditch areas of the wetland. PUS areas are in active agricultural crop production.
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Shalcar muck which is a hydric soil.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table. In addition, the Surprise Lake Tributary reach flowing through the wetland ditch carries perennial stream flows contributing hydrologic inputs to this portion of the wetland.
Wetland Rating/ Functions	Assumed Category III Primary functions include moderate water quality, hydrologic, and habitat functions. ESA listed salmonids are present in this reach of Surprise Lake Tributary (WDFW 2017a).

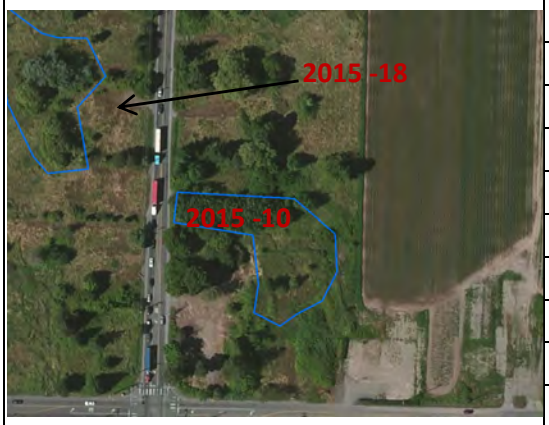
WETLAND U – INFORMATION SUMMARY			
Wetland previously identified as Wetland U in the 2005 WDR. Wetland U is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland U remains in active agricultural use in 2017.			
Location:	Section 8, Township 20N, Rage 4E		
	City of Fife		
	South of I-5 and the Interurban Trail., north of 20th St E., west of Milton Way, east of 70th Ave E.		
		**Local Jurisdiction**	Fife
		WRIA	Puyallup – White 10
		2005 Ecology & Local Rating	III
		2017 Anticipated Rating	III
		2017 Anticipated Fife Buffer	50 feet
		2005 Wetland Size	0.34 acre
		2017 Anticipated Wetland Size	0.35 acre
		2005 Cowardin Classification	PUS
		2017 Cowardin Classification	PUS
		HGM Classification	Depressional
Wetland Characteristics			
Dominant Vegetation	Vegetation remains unchanged from 2005 WDR conditions: active, planted, commercial agricultural vegetable crops.		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.		
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.		

WETLAND 2015 - 9 – INFORMATION SUMMARY	
Wetland 2015 - 9 is a newly added wetland not identified in the 2005 WDR. It occurs beyond the 2006 FEIS alignment but within the proposed SR 167 Phase 1 alignment. This wetland includes an area that was historically in cultivation which has recently been fallow allowing for a newly forming PEM community to develop, wetland areas in active cultivation, and a riverine section conveying a reach of the Surprise Lake Tributary.	
Location:	Section 5, Township 20N, Rage 4E
	City of Fife
	South of I-5 and the Interurban Trail., north of 20th St E., west of Milton Way, east of 70th Ave E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	5.03 acres (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PEM/PUS
HGM Classification	Depressional/Riverine

Wetland Characteristics	
Dominant Vegetation	PEM areas are recently fallowed field with a mix of weedy forbs and grasses with willow and cottonwood seedlings. PEM areas also occur in the wetland ditch areas and are dominated by reed canarygrass and broadleaf cattail. PUS areas are in active agricultural crop production.
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Tisch silt which is a hydric soil.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table. In addition, the Surprise Lake Tributary reach flowing through the wetland ditch carries perennial stream flows contributing hydrologic inputs to this portion of the wetland.
Wetland Rating/ Functions	Assumed Category III Primary functions include moderate water quality, hydrologic, and habitat functions. ESA listed salmonids are present in the riverine sections of this wetland (WDFW 2017a).

WETLAND 2015 - 10 – INFORMATION SUMMARY		
Wetland 2015 - 10 is a newly added wetland not identified in the 2005 WDR. It appears to occur within both the 2006 FEIS alignment and within the proposed SR 167 Phase 1 alignment. This wetland includes seasonally saturated and ponded PFO and PEM areas.		
Location:	Section 8, Township 20N, Rage 4E	
	City of Fife	
	South of I-5 and the Interurban Trail., north of 20th St E., west of Milton Way, east of 70th Ave E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	n/a
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	n/a
	2017 Anticipated Wetland Size	0.78 acre (estimated in 2015)
	2005 Cowardin Classification	n/a
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	PFO areas are dominated black cottonwood PEM areas are dominated by reed canarygrass with scattered individuals of red osier dogwood	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table.	
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality, hydrologic, and habitat functions.	

WETLAND 2015 - 17 – INFORMATION SUMMARY		
Wetland 2015 - 17 is a newly added wetland not identified in the 2005 WDR. It appears to occur within both the 2006 FEIS alignment and within the proposed SR 167 Phase 1 alignment. This wetland includes PFO and PSS areas that are likely seasonally ponded.		
Location:	Section 7, Township 20N, Rage 4E	
	City of Fife	
	South of I-5, north of 20th St E., west 70th Ave E., east of 62nd Ave E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	n/a
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	n/a
	2017 Anticipated Wetland Size	0.54 acre (estimated in 2015)
	2005 Cowardin Classification	n/a
	2017 Cowardin Classification	PFO/PSS
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	PFO areas are dominated by Pacific willow (*Salix lasiandra*) PSS areas are dominated by black hawthorn (*Crataegus douglasii*), Himalayan blackberry with reed canarygrass in the understory.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Predominant hydrology source is presumed seasonal inundation from precipitation accumulation on fine textured soils and a high water table.	
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality, hydrologic, and habitat functions.	

WETLAND 2015 - 18 – INFORMATION SUMMARY		
Wetland 2015 - 18 is a newly added wetland not identified in the 2005 WDR. It appears to occur within both the 2006 FEIS alignment and within the proposed SR 167 Phase 1 alignment. This wetland includes PFO and PEM areas that are likely seasonally ponded.		
Location:	Section 7, Township 20N, Rage 4E	
	City of Fife	
	South of I-5, north of 20th St E., west 70th Ave E., east of 62nd Ave E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	n/a
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	n/a
	2017 Anticipated Wetland Size	0.86 acre (estimated in 2015)
	2005 Cowardin Classification	n/a
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	PFO areas are dominated by black cottonwood and weeping willow (*Salix babylonica*) – likely planted remnant from prior residence. PEM areas are dominated by reed canarygrass with scattered rushes and Himalayan blackberry.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Predominant hydrology source is presumed seasonal inundation from precipitation accumulation on fine textured soils and a high water table.	
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality, hydrologic, and habitat functions.	

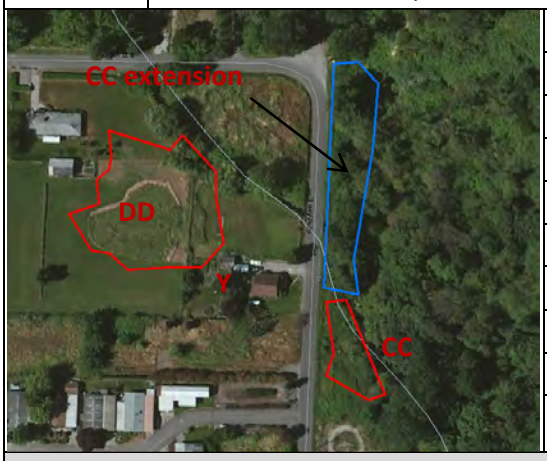
WETLAND AA – INFORMATION SUMMARY		
Wetland previously identified as Wetland AA in the 2005 WDR. Wetland AA is assumed to remain present, with boundaries unchanged, however conditions have changed since the 2005 WDR documentation, which indicates the wetland was in active cultivation. Wetland AA has been fallow for enough time to allow a young PFO community dominated by black cottonwood trees to establish in a portion of the wetland with additional PEM areas dominated by reed canarygrass.		
Location:	Section 6, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	North of SR 99, south of 12th St E., west of Hylebos Creek., east of 62nd Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	0.57 acre
	2017 Anticipated Wetland Size	0.57 acre
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Wetland AA identified in the 2005 WDR was classified as PUS indicating it was in current agricultural production at the time. The field has fallowed, allowing young black cottonwood trees with an understory of red osier dogwood to colonize a portion of the wetland, while remaining wetland areas are dominated by reed canarygrass.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions. Habitat functions have likely increased as a PFO and PEM vegetation communities have developed from the past PUS condition.	

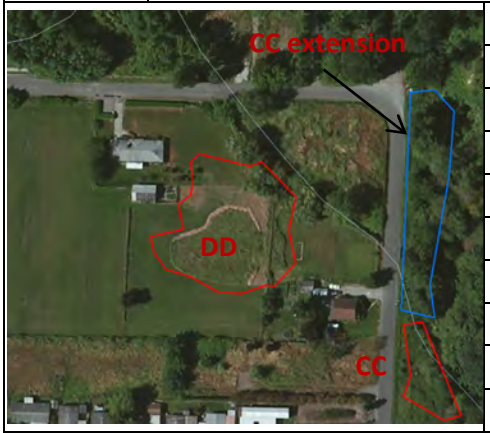
WETLAND BB – INFORMATION SUMMARY	
Wetland previously identified as Wetland BB in the 2005 WDR. Wetland BB is assumed to remain present, with boundaries unchanged, however conditions documented in the 2005 WDR are an assumed error. The 2005 WDR indicates that this wetland was in active agricultural practices with PUS crop, planted in cabbage (later the 2005 WDR indicates a different plant community dominated by red alder). It is unlikely that agricultural conditions were present in 2005. Wetland BB boundaries appear to remain unchanged from 2005, however the wetland is part of a wooded riparian corridor along the west side of Hylebos Creek. In 2015 and as re-verified in 2017, the wetland included mature forested vegetation. Based on landscape position and field observations, it appears that mature forested wetland was present in 2005 and currently remains in similar condition.	
Location:	Section 6, Township 20N, Rage 4E
	Unincorporated Pierce County/City of Fife
	North of 12th St E., south of 8th St E., west of Hylebos Creek., east of 62nd Ave E.



Local Jurisdiction	Pierce County/City of Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	II
2017 Anticipated Rating	II
2017 Anticipated Pierce Co./Fife Buffer	100 feet
2005 Wetland Size	0.84 acre
2017 Anticipated Wetland Size	0.84 acre
2005 Cowardin Classification	PUS
2017 Cowardin Classification	PFO
HGM Classification	Riverine

Wetland Characteristics	
Dominant Vegetation	Wetland BB identified in 2005 WDR was likely mistakenly classified as PUS, indicating it was in current agricultural production at the time, however mature red alder and Pacific willow dominate the overstory with reed canarygrass in the understory. This wetland is part of the Hylebos Creek riparian corridor. Site conditions have likely remained similar to 2005 conditions with forested wetland vegetation present.
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding and saturation with hydrologic influences in surface and groundwater directly related to flows in the adjacent Hylebos Creek.
Wetland Rating/ Functions	Category II Primary functions remain unchanged from 2005 WDR conditions: moderate to high water quality, hydrologic, and habitat functions. ESA listed salmonids are present in this reach of Hylebos Creek (WDFW 2017a).

WETLAND CC – INFORMATION SUMMARY		
Wetland previously identified as Wetland CC in the 2005 WDR. Wetland CC is assumed to remain present and in similar condition as documented in 2005 the WDR. Wetland CC remains a riverine wetland associated with Hylebos Creek. Overall wetland area increased to include additional PFO wetland areas previously unidentified in the 2005 WDR (blue area in photo).		
Location:	Section 6, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	North of 12th St E. and Hylebos Creek, south of 8th St E., east of 62nd Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	0.13 acre
	2017 Anticipated Wetland Size	0.52 acre (estimated in 2015)
	2005 Cowardin Classification	PEM
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Riverine
Wetland Characteristics		
Dominant Vegetation	PFO areas dominated by black cottonwood and willows PEM areas dominated by reed canarygrass and wet pasture grass	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation.	
Wetland Rating/ Functions	Category III Primary functions of moderate water quality and hydrologic functions remain the same as documented in the 2005 WDR, however habitat functions should also be noted as moderate as ESA listed salmonids are present in this reach of Hylebos Creek (WDFW 2017a).	

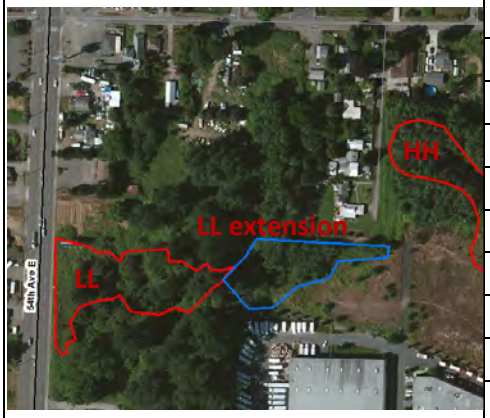
WETLAND DD – INFORMATION SUMMARY		
Wetland previously identified as Wetland DD in the 2005 WDR. Wetland DD is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland DD remains a pasture wetland in residential land use.		
Location:	Section 6, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	North of 12th St E., south of 8th St E., west of Hylebos Creek and 62nd Ave E., east of 54th Ave. E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	0.66 acre
	2017 Anticipated Wetland Size	0.66 acre
	2005 Cowardin Classification	PEM
	2017 Cowardin Classification	PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	PEM areas dominated by wet pasture grasses and weedy forbs.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation.	
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND EE – INFORMATION SUMMARY		
Wetland previously identified as Wetland EE in the 2005 WDR. Wetland EE is assumed to remain present, however overall wetland size and character of the vegetation have changed since the 2005 WDR documentation, which indicates the wetland was in active cultivation. Wetland EE has been fallow for enough time to allow a young PFO community dominated by black cottonwood trees and Scouler's willow (*Salix scouleriana*) to establish. Overall wetland area increased to include additional PFO wetland areas previously unidentified in the 2005 WDR (blue area in photo).		
Location:	Section 6, Township 20N, Rage 4E	
	City of Fife	
	North of 8th St E., south of 4th St E., west of Hylebos Creek, east of 56th Ave. E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	0.12 acre
	2017 Anticipated Wetland Size	0.37 acre (estimated in 2015)
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Wetland EE identified in 2005 WDR was classified as PUS indicating it was in current agricultural production at the time. The field has fallowed, allowing young black cottonwood trees and Scouler's willow to establish with an understory of hardhack, Himalayan blackberry, and reed canarygrass. PEM areas are dominated by pasture grasses and creeping buttercup.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding. Seasonal saturation is also likely in some areas of this wetland.	
Wetland Rating/ Functions	Category III Primary functions may have increased from 2005 WDR conditions: water quality and hydrologic functions are likely maintained at a moderate level. Habitat functions have likely increased as PFO and PEM vegetation communities has evolved from prior PUS condition.	

WETLAND GG – INFORMATION SUMMARY		
Wetland previously identified as Wetland GG in the 2005 WDR. Wetland GG is assumed to remain present, with boundaries unchanged, however conditions have changed since the 2005 WDR documentation, which indicates the wetland was in active cultivation. Wetland GG has been fallow for enough time to allow a young PFO community to establish dominated by black cottonwood trees, Pacific and Sitka willows. Wetland GG extends beyond the proposed SR 167 Phase 1 alignment to the northeast.		
Location:	Section 6, Township 20N, Rage 4E	
	City of Fife	
	North of 8th St E., south of 4th St E., west of Hylebos Creek, east of 56th Ave. E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	1.8 acres
	2017 Anticipated Wetland Size	1.8 acres
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PFO
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Wetland GG identified in 2005 WDR was classified as PUS indicating it was in current agricultural production at the time. The field has fallowed, allowing young black cottonwood trees and willows to establish with an understory of hardhack, Himalayan blackberry, reed canarygrass, and creeping buttercup.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding. Seasonal saturation is also likely in some areas of this wetland.	
Wetland Rating/ Functions	Category III Primary functions may have increased from 2005 WDR conditions: water quality and hydrologic functions are likely maintained at a moderate level. Habitat functions have likely increased as a PFO vegetation community has evolved from prior PUS condition.	

WETLAND HH – INFORMATION SUMMARY		
Wetland previously identified as Wetland HH in the 2005 WDR. Wetland HH is assumed to remain present, with boundaries unchanged, however conditions have changed since the 2005 WDR documentation, which indicates the wetland was in active cultivation. Wetland HH has been fallow for enough time to allow a young PFO community dominated by black cottonwood trees and willows to establish. Wetland boundaries of PFO areas seem consistent with boundaries identified in the 2005 WDR. Careful investigation of PEM boundaries will be required when the site is delineated, as boundaries in PEM areas may have changed.		
Location:	Section 6, Township 20N, Rage 4E	
	City of Fife	
	North of 8th St E., south of 4th St E., west of Hylebos Creek, east of 56th Ave. E.	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	1.5 acres
	2017 Anticipated Wetland Size	1.5 acres
	2005 Cowardin Classification	PUS
	2017 Cowardin Classification	PFO/PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Wetland HH identified in 2005 WDR was classified as PUS indicating it was in current agricultural production at the time. The field has fallowed, allowing young black cottonwood trees and willows to colonize PFO areas of the wetland. PEM areas are dominated by weedy pasture grasses and forbs including meadow foxtail (*Alopecurus pratensis*), colonial bentgrass, intermixed with scattered soft rush and Himalayan blackberry.	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding. Seasonal saturation is also likely in some areas of this wetland.	
Wetland Rating/ Functions	Category III Primary functions may have increased from 2005 WDR conditions: water quality and hydrologic functions are likely maintained at a moderate level. Habitat functions have likely increased as PFO and PEM vegetation communities has evolved from prior PUS condition.	

WETLAND LL – INFORMATION SUMMARY	
Wetland previously identified as Wetland LL in the 2005 WDR. Wetland LL is assumed to remain present, however overall wetland size has changed since the 2005 WDR documentation. Wetland LL boundaries extend to the east of what was identified in the 2005 WDR to include a young PFO wetland. The LL extension area may have previously been in cultivation and likely has been fallow for enough time to allow a young PFO community dominated by black cottonwood trees and willows to establish (blue area in photo).	
Location:	Section 6, Township 20N, Rage 4E
	City of Fife
	North of 8th St E., south of 4th St E., west of 56th Ave E., east of 54th Ave. E.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	1.2 acre
2017 Anticipated Wetland Size	2.02 acres (estimated in 2015)
2005 Cowardin Classification	PFO
2017 Cowardin Classification	PFO
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Trees - black cottonwood, Scouler's willow Shrubs – red osier dogwood Herbs – reed canarygrass, soft rush
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation. Seasonal ponding is also likely in some areas of this wetland.
Wetland Rating/ Functions	Category III Primary functions remain unchanged from 2005 WDR conditions: moderate hydrologic and habitat functions. Water quality functions are also likely provided at moderate levels.

WETLAND 2015 – 13/SR 509 Erdahl Ditch WSDOT Mitigation Site – INFORMATION SUMMARY	
Wetland 2015 - 13 is the SR 509 Erdahl Ditch WSDOT wetland mitigation site. It was not identified in the 2005 WDR likely because it occurred beyond the 2006 FEIS alignment, but is within the proposed SR 167 Phase 1 alignment. This wetland was named with the naming convention for wetlands newly added during 2015 field work. This wetland historically included a PFO community established in a ditched wetland area between SR 509 to the north and commercial development to the south. In the Fall of 2014, a die-off of the PFO community occurred due to an unknown origin. The site is currently dominated by PSS and PEM vegetation communities.	
Location:	Section , Township 20N, Rage 3E
	City of Fife
	North of Pacific Highway E., south of SR 509, west of Alexander Ave E., east of Port of Tacoma Rd.



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	1.25 acre (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PSS
HGM Classification	Riverine

Wetland Characteristics	
Dominant Vegetation	This wetland historically included a PFO community established in a ditched wetland area between SR 509 to the north and commercial development to the south. In the Fall of 2014, a die-off of the PFO community occurred due to an unknown origin. The wetland ditch is currently dominated by a community of mature willows.
Mapped Soils	Tacoma silt loam. Mapped soil is hydric.
Hydrology	Predominant hydrology source is presumed seasonal inundation. Inputs are likely from precipitation and runoff from surrounding upland areas via the wetland ditch.
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate hydrologic functions and low water quality and habitat functions.

WETLAND 2015 - 14 – INFORMATION SUMMARY		
Wetland 2015 - 14 is a previously identified wetland, however it was not identified in the 2005 WDR because it appears to occur just west of the 2006 FEIS alignment. It is within the proposed SR 167 Phase 1 alignment. This wetland was named with the naming convention for wetlands newly added during 2015 field work. This wetland includes a PEM community established in a cloverleaf off ramp from I-5 to 54th Ave E.		
Location:	Section 7, Township 20N, Rage 4E	
	City of Fife	
	In I-5 northbound cloverleaf off ramp at Exit 137 for 54th St E	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	n/a
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	n/a
	2017 Anticipated Wetland Size	0.3 acre (estimated in 2015)
	2005 Cowardin Classification	n/a
	2017 Cowardin Classification	PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Trees – several individual roadside plantings of maples (*Acer spp.*) Herbs – reed canarygrass	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Predominant hydrology is presumed seasonal saturation and inundation. Wetland has a ditch along its eastern edge. Inputs are likely from precipitation and runoff from surrounding upland areas.	
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality and hydrologic functions, with low habitat functions.	

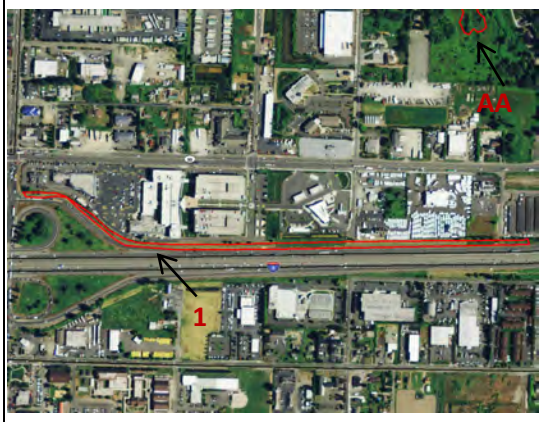
WETLAND 2015 - 15 – INFORMATION SUMMARY	
Wetland 2015 - 15 is a previously identified wetland, however it was not identified in the 2005 WDR because it appears to occur just west of the 2006 FEIS alignment. It is within the proposed SR 167 Phase 1 alignment. This wetland was named with the naming convention for wetlands newly added during 2015 field work. This wetland includes PFO and PEM communities established in a cloverleaf on ramp to southbound I-5 from 54th Ave E.	
Location:	Section 7, Township 20N, Rage 4E
	City of Fife
	In I-5 southbound cloverleaf on ramp at Exit 137 from 54th St E



Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.74 acre (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO/PEM
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	Trees – several individual trees; could be roadside plantings or willows Herbs – reed canarygrass
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology is presumed seasonal saturation and inundation. Wetland may have a ditch along its eastern edge. Inputs are likely from precipitation and runoff from surrounding upland areas.
Wetland Rating/ Functions	Assumed Category III Primary functions likely include moderate water quality and hydrologic functions, with low habitat functions.

WETLAND 1 – INFORMATION SUMMARY	
Wetland previously identified as Wetland 1 in the 2005 WDR. Wetland 1 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 1 remains a wetland ditch paralleling the north side of I-5.	
Location:	Section 7, Township 20N, Rage 4E
	City of Fife
	North of I-5 between MP 137.47 and 138.17, south of SR 99., west of 70th Ave E, east of 54th Ave E

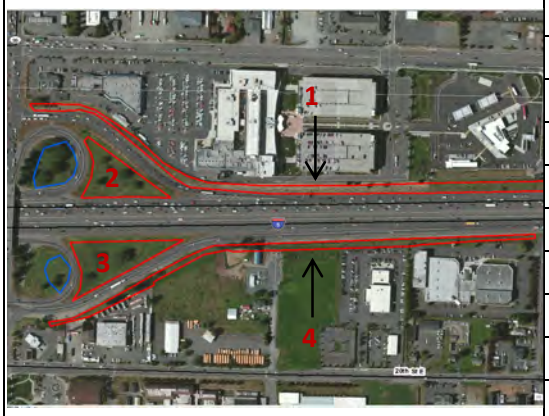


Local Jurisdiction	Fife
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Fife Buffer	50 feet
2005 Wetland Size	3.2 acers
2017 Anticipated Wetland Size	3.2 acres
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PEM
HGM Classification	Riverine

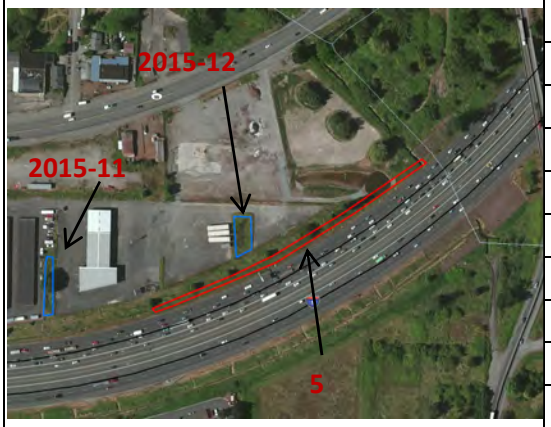
Wetland Characteristics	
Dominant Vegetation	reed canarygrass
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding contributed as sheet flow from adjacent uplands.
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.

WETLAND 2 – INFORMATION SUMMARY		
Wetland previously identified as Wetland 2 in the 2005 WDR. Wetland 2 is assumed to remain present and in similar condition as documented in the 2005 WDR. It is within the proposed SR 167 Phase 1 alignment. Wetland 2 remains encompassed by the southbound I-5 main line, and on and off ramps at Exit 137 to and from 54th St E.		
Location:	Section 7, Township 20N, Rage 4E	
	City of Fife	
	Between I-5 southbound main line and the on and off ramps at Exit 137 to 54th St E	
	**Local Jurisdiction**	Fife
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	III
	2017 Anticipated Fife Buffer	50 feet
	2005 Wetland Size	1.2 acers
	2017 Anticipated Wetland Size	1.25 acres
	2005 Cowardin Classification	PEM
	2017 Cowardin Classification	PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Trees - several individual trees; could be roadside plantings or willows Herbs - reed canarygrass	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation.	
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND 3 – INFORMATION SUMMARY			
Wetland previously identified as Wetland 3 in the 2005 WDR. Wetland 3 is assumed to remain present and in similar condition as documented in the 2005 WDR. It is within the proposed SR 167 Phase 1 alignment. Wetland 3 remains encompassed by the northbound I-5 main line, and on and off ramps at Exit 137.			
Location:	Section 7, Township 20N, Rage 4E		
	City of Fife		
	Between I-5 northbound main line and the on and off ramps at Exit 137 to and from 54th St E		
	**Local Jurisdiction**	Fife	
	WRIA	Puyallup – White 10	
	2005 Ecology & Local Rating	III	
	2017 Anticipated Rating	III	
	2017 Anticipated Fife Buffer	50 feet	
	2005 Wetland Size	1.6 acers	
	2017Anticipated Wetland Size	1.6 acres	
	2005 Cowardin Classification	PEM	
	2017 Cowardin Classification	PEM	
	HGM Classification	Depressional	
Wetland Characteristics			
Dominant Vegetation	Trees - several individual trees; could be roadside plantings or willows Herbs - reed canarygrass		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal saturation.		
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.		

WETLAND 4 – INFORMATION SUMMARY			
Wetland previously identified as Wetland 4 in the 2005 WDR. Wetland 4 is assumed to remain present and in similar condition as documented in the 2005 WDR. It is within the proposed SR 167 Phase 1 alignment. Wetland 4 remains a wetland ditch paralleling the south side of I-5.			
Location:	Section 7, Township 20N, Rage 4E		
	City of Fife		
	South of I-5 between MP 137.48 and 137.91, north of 20th St E, west of 62nd Ave E, east of 54th Ave E.		
		**Local Jurisdiction**	Fife
		WRIA	Puyallup – White 10
		2005 Ecology & Local Rating	III
		2017 Anticipated Rating	III
		2017 Anticipated Fife Buffer	50 feet
		2005 Wetland Size	1.5 acers
		2017 Anticipated Wetland Size	1.5 acres
		2005 Cowardin Classification	PEM
		2017 Cowardin Classification	PSS/PEM
		HGM Classification	Riverine
Wetland Characteristics			
Dominant Vegetation	Shrubs – black cottonwood saplings and young willows Herbs - reed canarygrass		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.		
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.		

WETLAND 5 – INFORMATION SUMMARY	
Wetland previously identified as Wetland 5 in the 2005 WDR. Wetland 5 is assumed to remain present and in similar condition as documented in the 2005 WDR. It is within the proposed SR 167 Phase 1 alignment. Wetland 5 remains a wetland ditch paralleling the north side of I-5.	
Location:	Section 6 & 7, Township 20N, Rage 4E
	Unincorporated Pierce County
	North of I-5 between MP 138.26 and 138.43, south of SR 99, west of 70th Ave E, east of 54th Ave E.



Local Jurisdiction	Pierce County
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Pierce Co. Buffer	50 feet
2005 Wetland Size	0.35 acre
2017 Anticipated Wetland Size	0.35 acre
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PEM
HGM Classification	Riverine

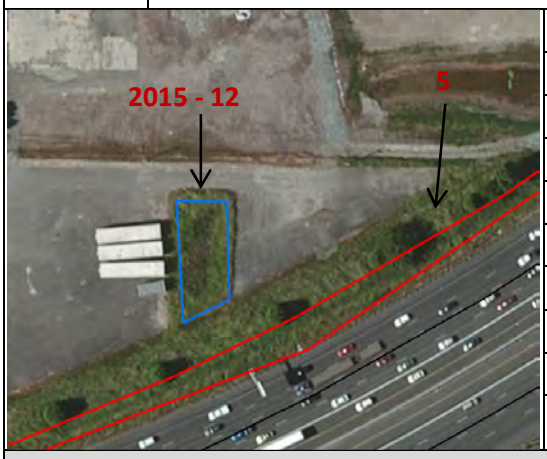
Wetland Characteristics	
Dominant Vegetation	reed canarygrass
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.

WETLAND 2015 - 11 – INFORMATION SUMMARY	
Wetland 2015 - 11 is a previously identified wetland, however it was not identified in the 2005 WDR because it appears to occur just north of the 2006 FEIS alignment. It is within the proposed SR 167 Phase 1 alignment. This wetland was named with the naming convention for wetlands newly added during 2015 field work. This wetland includes a young PFO community established in a ditched wetland area between commercial developments.	
Location:	Section 7, Township 20N, Rage 4E
	Unincorporated Pierce County
	North of I-5., south of SR 99, west of 70th Ave E., east of 54th Ave E.



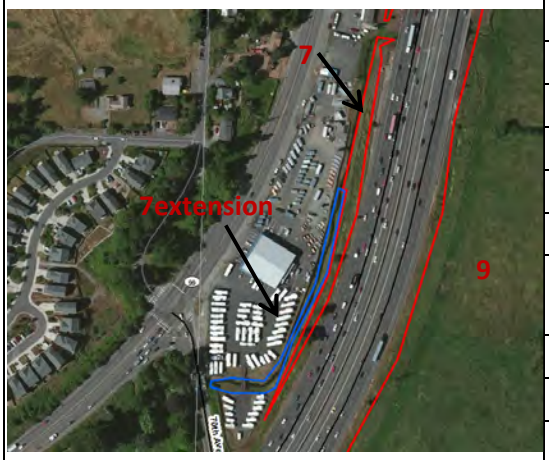
Local Jurisdiction	Pierce County
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	III
2017 Anticipated Pierce Co. Buffer	50 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	0.07 acre (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO
HGM Classification	Riverine

Wetland Characteristics	
Dominant Vegetation	Trees – Black cottonwood Herbs – reed canarygrass, soft rush, woolgrass (*Scirpus cyperinus*)
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation. Wetland may have a culvert entering into it on the northern/upslope boundary. Inputs are likely from the culvert and precipitation and runoff from surrounding upland areas.
Wetland Rating/ Functions	Assumed Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.

WETLAND 2015 - 12 – INFORMATION SUMMARY		
Wetland 2015 - 12 is a previously identified wetland, however it was not identified in the 2005 WDR because it appears to occur just north of the 2006 FEIS alignment. It is within the proposed SR 167 Phase 1 alignment. This wetland was named with the naming convention for wetlands newly added during 2015 field work. This wetland includes a PEM community established in a depression.		
Location:	Section 7, Township 20N, Rage 4E	
	Unincorporated Pierce County	
	North of I-5., south of SR 99, west of 70th Ave E., east of 54th Ave E.	
	**Local Jurisdiction**	Pierce County
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	n/a
	2017 Anticipated Rating	III
	2017 Anticipated Pierce Co. Buffer	50 feet
	2005 Wetland Size	n/a
	2017 Anticipated Wetland Size	0.09 acre (estimated in 2015)
	2005 Cowardin Classification	n/a
	2017 Cowardin Classification	PEM
	HGM Classification	Depressional
Wetland Characteristics		
Dominant Vegetation	Broadleaf cattail, woolgrass, reed canarygrass	
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.	
Hydrology	Predominant hydrology source is presumed seasonal saturation and inundation from precipitation accumulation on fine textured soils and a high water table and runoff from surrounding upland areas.	
Wetland Rating/ Functions	Assumed Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.	

WETLAND 6 – INFORMATION SUMMARY			
Wetland previously identified as Wetland 6 in the 2005 WDR. Wetland 6 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 6 remains a wetland ditch paralleling the south side of I-5.			
Location:	Section 7, Township 20N, Rage 4E		
	City of Fife		
	South of I-5 between MP 137.93 and 138.44, north of 20th St E, east of 70th Ave E., west of 62nd Ave E.		
	**Local Jurisdiction**	Fife	
	WRIA	Puyallup – White 10	
	2005 Ecology & Local Rating	III	
	2017 Anticipated Rating	III	
	2017 Anticipated Fife Buffer	50 feet	
	2005 Wetland Size	1.3 acres	
	2017 Anticipated Wetland Size	1.3 acres	
	2005 Cowardin Classification	PEM	
	2017 Cowardin Classification	PEM	
	HGM Classification	Riverine	
Wetland Characteristics			
Dominant Vegetation	reed canarygrass, creeping buttercup, broadleaf cattail, horsetails (*Equisetum spp.*)		
Mapped Soils	Sultan silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding.		
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.		

WETLAND 7 – INFORMATION SUMMARY	
Wetland previously identified as Wetland 7 in the 2005 WDR. Wetland 7 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 7 remains a wetland containing a reach of Hylebos Creek along the west side of I-5. Overall wetland area increased to include additional PEM wetland areas previously unidentified in the 2005 WDR (blue area in photo).	
Location:	Section 5, Township 20N, Rage 4E
	Unincorporated Pierce County
	West of I-5 between MP 138.56 and 138.77, east of SR 99., north of 70th Ave E, south of Porter Way



Local Jurisdiction	Pierce County
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Pierce Co. Buffer	50 feet
2005 Wetland Size	0.49 acre
2017 Anticipated Wetland Size	0.92 acre (estimated in 2015)
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PEM
HGM Classification	Riverine

Wetland Characteristics	
Dominant Vegetation	reed canarygrass
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Tisch silt which is a hydric soil.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonal ponding. Wetland 7 carries a reach of Hylebos Creek, which is the primary source of hydrology in this wetland.
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality, hydrologic, and habitat functions. ESA listed salmonids are present in this reach of Hylebos Creek.

WETLAND 8 – INFORMATION SUMMARY	
Wetland previously identified as Wetland 8 in the 2005 WDR. Wetland 8 is assumed to remain present and in similar condition as documented in 2005 WDR. Wetland 8 remains a wetland ditch along the west side of I-5. The wetland boundary continues west of the proposed SR 167 Phase 1 alignment (blue area in photo).	
Location:	Section 5, Township 20N, Rage 4E
	Unincorporated Pierce County/City of Milton
	West of I-5 between MP 138.56 and 138.77, east of SR 99., north of 70th Ave E, south of Porter Way



Local Jurisdiction	Pierce County/Milton
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Pierce Co./Milton Buffer	50/105 feet
2005 Wetland Size	0.49 acre
2017 Anticipated Wetland Size	2.36 acre (estimated in 2015)
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PFO/PEM
HGM Classification	Depressional/Riverine

Wetland Characteristics	
Dominant Vegetation	PFO section – black cottonwood with an understory of red osier dogwood PEM section - reed canarygrass
Mapped Soils	Sultan silt loam, which is not a hydric soil, and Tisch silt which is a hydric soil.
Hydrology	Presumed hydrology includes seasonal ponding in both the PFO/depressional areas and the PEM/riverine areas.
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality, hydrologic, and habitat functions.

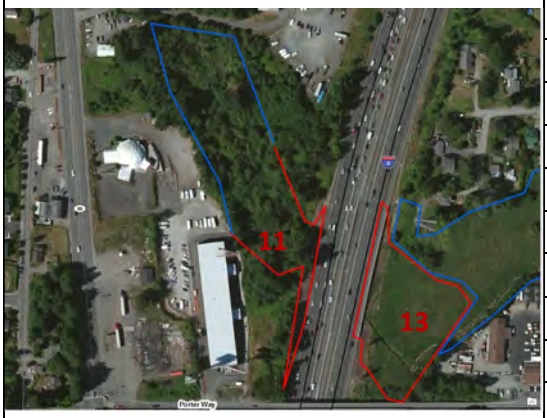
WETLAND 9 – INFORMATION SUMMARY		
Wetland previously identified as Wetland 9 in the 2005 WDR. Wetland 9 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 9 remains a 50+ acre wetland, conveying a reach of Hylebos Creek, along the east side of I-5 and directly north of the Interurban Trail. The wetland boundary continues east of the proposed refined alignment (blue area in photo).		
Location:	Section 5, Township 20N, Rage 4E	
	Unincorporated Pierce County/City of Milton	
	East of I-5, south and west of Porter Way E, north and east of 70th Ave E crossing of I-5	
	**Local Jurisdiction**	Pierce County/Milton
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	II
	2017 Anticipated Pierce Co./Milton Buffer	100/165 feet
	2005 Wetland Size	50+ acres
	2017 Anticipated Wetland Size	66.56 acres
	2005 Cowardin Classification	PSS/PEM
	2017 Cowardin Classification	PFO/PSS/PEM
	HGM Classification	Depressional/Riverine
Wetland Characteristics		
Dominant Vegetation	Wetland 9 is predominantly PEM dominated by reed canarygrass. Small PFO areas are dominated by Pacific willow. PSS areas dominated by hardhack and redosier dogwood.	
Mapped Soils	Wetland 9 is predominantly mapped with Semiahmoo muck and Tisch silt which are hydric soils. Wetland fringes on the north and south are mapped as Sultan silt loam and Kitsap silt loam, which are not hydric soils.	
Hydrology	Assumed hydrology: seasonal saturation and ponding. Hylebos Creek also contributes perennial flows and seasonal flood water to portions of the wetland.	
Wetland Rating/ Functions	Category II Primary functions are likely: high water quality and hydrologic functions, with moderate habitat functions. Arsenic contamination is present in portions of Wetland 9, leaching in from the adjacent B & L Woodwaste landfill containing slag from the historic Asarco smelting operation. Hylebos Creek contributes seasonal flood waters and the large wetland has an ability to attenuate significant volumes of flood water. ESA listed salmonids are present in this reach of Hylebos Creek.	

WETLAND 2015 - 16 – INFORMATION SUMMARY		
Wetland 2015 - 16 is a newly added wetland not identified in the 2005 WDR. It occurs beyond the 2006 FEIS alignment, and beyond the SR 167 Phase 1 alignment. This wetland includes an area that may currently be connected to Wetland 9. If it is not currently connected to Wetland 9, it is likely that historically the two wetlands were connected. The wetland occurs in a depression, surrounded by development areas likely constructed on fill. The wetland boundary continues east of the proposed SR 167 Phase 1 alignment.		
Location:	Section 5, Township 20N, Rage 4E	
	City of Milton	
	East of I-5, south and west of Porter Way	



Local Jurisdiction	Milton
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	n/a
2017 Anticipated Rating	II
2017 Anticipated Milton Buffer	105 feet
2005 Wetland Size	n/a
2017 Anticipated Wetland Size	4.46 acres (estimated in 2015)
2005 Cowardin Classification	n/a
2017 Cowardin Classification	PFO/PEM
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	PSS – willows, black cottonwood, red alder PEM – reed canarygrass
Mapped Soils	Semiahmoo muck. Mapped soil is hydric.
Hydrology	Assumed hydrology: seasonal saturation and ponding
Wetland Rating/ Functions	Category II Primary functions are likely: moderate water quality, hydrologic, and habitat functions

WETLAND 11 – INFORMATION SUMMARY		
Wetland previously identified as Wetland 11 in the 2005 WDR. Wetland 11 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 11 appears to consist of forested and scrub shrub wetland, conveying a reach of West Hylebos Creek, west of I-5. The wetland boundary continues west of the proposed SR 167 Phase 1 alignment (blue area in photo).		
Location:	Section 5, Township 20N, Rage 4E	
	City of Milton	
	West of I-5, east of SR 99, north of Porter Way E	
	**Local Jurisdiction**	Milton
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	II
	2017 Anticipated Rating	II
	2017 Anticipated Milton Buffer	165 feet
	2005 Wetland Size	1.3 acres
	2017 Anticipated Wetland Size	3.89 acres (estimated in 2015)
	2005 Cowardin Classification	PSS/PEM
	2017 Cowardin Classification	PFO/PSS
	HGM Classification	Depressional/Riverine
Wetland Characteristics		
Dominant Vegetation	PFO – black cottonwood, willows PSS - red osier dogwood	
Mapped Soils	Semiahmoo muck. Mapped soil is hydric.	
Hydrology	Assumed hydrology: seasonal saturation and ponding. West Hylebos Creek also contributes perennial flows and likely seasonal flood water to portions of the wetland.	
Wetland Rating/ Functions	Category II Primary functions are likely: moderate water quality, hydrologic, and habitat functions. ESA listed salmonids are present in this reach of West Hylebos Creek.	

WETLAND 13 – INFORMATION SUMMARY		
Wetland previously identified as Wetland 13 in the 2005 WDR. Wetland 13 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 13 appears to consist of forested and scrub shrub wetland, encompassing the confluence of West Hylebos Creek and Hylebos Creek, east of I-5. The wetland boundary continues east of the proposed SR 167 Phase 1 alignment (blue area in photo).		
Location:	Section 5, Township 20N, Rage 4E	
	City of Milton	
	East of I-5, west of 5th Ave, north of Porter Way	
	**Local Jurisdiction**	Milton
	WRIA	Puyallup – White 10
	2005 Ecology & Local Rating	III
	2017 Anticipated Rating	II
	2017 Anticipated Milton Buffer	165 feet
	2005 Wetland Size	2.2 acres
	2017 Anticipated Wetland Size	8.17 acres (estimated in 2015)
	2005 Cowardin Classification	PSS/PEM
	2017 Cowardin Classification	PSS/PEM
	HGM Classification	Depressional/Riverine
Wetland Characteristics		
Dominant Vegetation	PSS - willows, hardhack, red osier dogwood PEM – reed canarygrass	
Mapped Soils	Semiahmoo muck. Mapped soil is hydric.	
Hydrology	Assumed hydrology: seasonal saturation and ponding. Hylebos Creek also contributes perennial flows and likely seasonal flood water to portions of the wetland.	
Wetland Rating/ Functions	Category II Primary functions are likely: moderate water quality, hydrologic, and habitat functions. ESA listed salmonids are present in this reach of Hylebos Creek.	

WETLAND 14 – INFORMATION SUMMARY	
Wetland previously identified as Wetland 14 in the 2005 WDR. Wetland 14 is assumed to remain present and in similar condition as documented in the 2005 WDR with the exception that the vegetation community has changed from PEM to PSS. Wetland 14 remains a wetland ditch paralleling the east side of I-5.	
Location:	Section 5, Township 20N, Rage 4E
	City of Milton
	East of I-5 between MP 139.32 and 139.37, west of Milton Rd S., just west of Comet St. dead end



Local Jurisdiction	Milton
WRIA	Puyallup – White 10
2005 Ecology & Local Rating	III
2017 Anticipated Rating	III
2017 Anticipated Milton Buffer	60 feet
2005 Wetland Size	0.92 acre
2017 Anticipated Wetland Size	0.92 acre
2005 Cowardin Classification	PEM
2017 Cowardin Classification	PSS
HGM Classification	Depressional

Wetland Characteristics	
Dominant Vegetation	PSS – willows with an understory of reed canarygrass
Mapped Soils	Kitsap silt loam. Mapped soil is not hydric.
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonally saturated. In addition, seasonal ponding is also likely in this wetland.
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.

WETLAND 15 – INFORMATION SUMMARY			
Wetland previously identified as Wetland 15 in the 2005 WDR. Wetland 15 is assumed to remain present and in similar condition as documented in the 2005 WDR. Wetland 15 remains a wetland ditch paralleling the east side of I-5.			
Location:	Section 32, Township 21N, Rage 4E		
	City of Milton		
	East of I-5 between MP 139.57 and 139.63, west of Milton Rd S., just north of Alder St. dead end		
		**Local Jurisdiction**	Milton
		WRIA	Puyallup – White 10
		2005 Ecology & Local Rating	III
		2017 Anticipated Rating	III
		2017 Anticipated Milton Buffer	60 feet
		2005 Wetland Size	0.14 acre
		2017 Anticipated Wetland Size	0.14 acre
		2005 Cowardin Classification	PSS/PEM
		2017 Cowardin Classification	PSS/PEM
		HGM Classification	Depressional
Wetland Characteristics			
Dominant Vegetation	PSS – willows, black hawthorn, hardhack PEM – reed canarygrass		
Mapped Soils	Kitsap silt loam. Mapped soil is not hydric.		
Hydrology	Hydrology assumed unchanged from 2005 WDR conditions: seasonally saturated. In addition, seasonal ponding is also likely in this wetland.		
Wetland Rating/ Functions	Category III Primary functions are likely: moderate water quality and hydrologic functions, with low habitat functions.		

Wetland Functions

Physical characteristics of wetlands and their surroundings influence the functions they perform including: HGM class, Cowardin class, buffer condition, habitat connectivity, and landscape position. Wetlands in the project vicinity provide a range of water quality, hydrologic, and habitat functions. Functions for wetlands documented in the 2005 WDR generally remain unchanged. When conditions differ from 2005 WDR documentation, or when a new wetland was added during the 2015 wetland inventory, a brief summary of anticipated functions is provided in the wetland summary tables.

There are generally two types of wetlands in the project vicinity: vegetated wetlands and wetlands in current or recent agricultural production. In general, vegetated wetlands filter nutrients and toxicants, trap sediments from stormwater and agricultural runoff, provide flood attenuation functions during and following precipitation events, and provide high to low habitat functions. Some wetlands contain reaches of streams with documented use by ESA listed salmonids (USFWS 2017; WDFW 2017a). Agricultural wetlands in the project vicinity generally provide moderate nutrient, toxicant, and sediment trapping as well as some flood attenuation, and provide low habitat functions.

Wetlands in the project vicinity are not likely to provide educational functions due to inaccessibility for a large groups and lack of adequate parking. Other than ESA listed salmonids (WDFW 2017a), priority habitats (WDFW 2017b), sensitive wildlife species (WDFW 2017c), or rare plants (WNHP 2017) are not known to occur within the project. The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species data show wetlands, waterfowl concentrations, and biodiversity areas and corridors adjacent to the project (WDFW 2017b). Wetlands B, P, and Q are likely Category I wetlands based on special characteristics for mature forested wetlands with wetlands B and P likely obtaining a dual rating of Category I/III to characterize their wetland ditch sections as well as mature forested sections.

Wetland Buffers

Wetland buffers in the proposed SR 167 Phase 1 alignment generally provide little to no buffering function. Many wetlands occur in agricultural fields where buffering functions are not present. Other wetlands abut local surface streets, state routes or interstate highway, or commercial or residential developments, where buffering function is limited to lacking. Wetlands north of I-5 and south of SR 509, occurring adjacent to Hylebos Creek or within its riparian corridor (Wetlands AA through HH) have intact, high functioning buffers along their east side, consisting of mature riparian forested corridor and other wetlands around Hylebos Creek, as well as mature upland forests along steep slopes. Several areas of upland forested habitat around Hylebos Creek are designated biodiversity areas and corridors in the WDFW priority habitats and species program (WDFW 2017b).

Invasive species are present in wetland buffers, and are intermixed with native and introduced species. Common invasive species in the buffer include Himalayan blackberry and reed canarygrass. Native trees including Douglas-fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*) are scattered in some buffer areas.

4. Would the Phase 1 Improvements result in any new or significant impacts?

The 2015 wetland inventory and analysis suggests that potential wetland impacts from the proposed project are currently less than indicated in the 2005 WDR. An estimated decrease from 32.94 acres to 24.83 acres is shown in Table 3. The estimated impact quantity from the 2015 inventory is intended to provide a qualitative update to the 2005 WDR. A summary of estimated wetland buffer impacts is presented in Table 4. A detailed account of estimated wetland and buffer impacts by individual wetland is included in Table 5.

Table 3. Summary of estimated permanent wetland impact changes between 2005 WDR and 2017

	Total impacts to Category I wetlands	Total impacts to Category II wetlands	Total impacts to Category III wetlands	Total impacts to Category IV wetlands
2005[a]	0 acres	0.8 acres	32.1 acres	0.04 acres
2017	1.48 acres	10.80 acres	12.38 acres	0.17 acres

Total permanent wetland impacts 2005	32.94 acres
Total permanent wetland impacts 2017	24.83 acres

[a] 2005 impact numbers from the 2005 Wetland Discipline Report Table 4-10 (WSDOT 2005).
[b] 2017 impact numbers from 167 Project Plan Sheets (WSDOT 2018; Attachment C)

The qualitative assessment conducted in 2015 and re-verified in 2017 suggests that overall wetland acreage in the corridor has increased since 2006. The underlying reason for the increase in overall wetland acreage is not definitively known. However, there have been changes in land use and land ownership in the corridor and related changes to hydrology are likely. Increased commercial development in the lower Puyallup River Valley in areas adjacent to the proposed SR 167 Phase 1 alignment may be linked to hydrological changes within the corridor. Other changes in land ownership and use may contribute. Several parcels, previously in farmer-owned agriculture, have been transferred into WSDOT ownership during earlier phase of project development. This transition undoubtedly involved changes in land use practices, and farmers may have been historically managing land to achieve optimum drainage for agricultural purposes. A less aggressive approach to drainage under WSDOT ownership could have precipitated an increase in hydrologic pressure on fallowed land. These causes should be considered speculative. To determine the actual causes of what appears to be an increase in wetland acreage would require more intensive study and is beyond the scope of this report.

Despite an apparent overall increase in wetland acreage in the project vicinity, again, current analysis indicates potential impacts will be lower currently than in 2006. This is attributed to the scaled back and smaller footprint of the proposed SR 167 Phase 1 Improvements described in Section 2 of this memorandum.

All of the information presented in this report is qualitative and represent preliminary findings pending later wetland delineations and ratings. However, it is expected to serve as a valuable update to the 2005 WDR in at least two respects. It will inform the developing SR 167 Completion Project design concerning further avoidance and minimization of impacts to wetlands, and protection of environmental resources. It should also provide a valuable starting point for the pending formal wetland delineation and assessment to be conducted for project environmental permitting.

Table 4. ……Wetland Buffer Impacts

Total permanent wetland buffer impacts 2005[a]	58.2 acres
Total permanent wetland buffer impacts 2017	50.39 acres

[a] 2005 impact numbers from the 2005 Wetland Discipline Report page 4-7 (WSDOT 2005).
[b] 2017 impact numbers from 167 Project Plan Sheets (WSDOT 2018; Attachment C)

Wetland buffer impacts shown in Table 4 were applied based on local jurisdictions municipal code requirements (Table 2). Where wetland and stream buffers overlap, the buffer is considered wetland buffer.

Table 5. Wetland and Buffer Impacts by Individual Wetland

Wetland[a]	Cowardin[b]	HGM	ECY[c] & local[d] Rating 2005	ECY[c] & local[d] Rating 2015	Wtld Size (ac)	Impact 2017 (ac)	Buffer Impact
A	PUS	depressional	III	III	1.2	0.00	0.00
B	PFO/PEM/PUS	depressional	III	I / III	12.13	.16	1.81
C	PSS	depressional	III	III	0.32	0.21	0.39
D	PUS	depressional	III	III	2.0	0.45	0.45
E	PUS	depressional	III	III	2.01	1.42	0.58
UU	PEM	riverine	II	II	2.33	0.62	0.91
V	PEM	riverine	II	II	1.55	0.00	0.38
2015 - 1	PEM	depressional	n/a	III	0.39	0.10	0.41
2015 - 2	PFO	depressional	n/a	III	0.75	0.16	0.38
2015 - 3	PEM	depressional	n/a	III	0.11	0.11	0.32
K	PEM	depressional	III	III	0.09	0.03	0.34
O	PUS	depressional	III	III	0.28	0.28	0.66
P	PFO/PEM	depressional	III	I / III	2.82	0.85	8.02
Q	PFO	depressional	III	I	1.2	0.47	1.38
2015 - 4	PFO/PEM	depressional	n/a	III	6.29	2.53	0.33
S/T/W	PFO/PSS/PEM	depressional/riverine	III	II	24.83	7.15	1.59
2015-5	PSS/PEM	depressional	n/a	III	0.20	0.00	0.00
Y	PUS	depressional	III	III	1.96	0.92	1.39
2015 - 6	PEM/PUS	depressional	n/a	III	0.69	0.00	0.00
2015 - 7	PEM	riverine	n/a	IV	0.56	0.17	0.54
2015 - 8	PFO/PEM/PUS	depressional/riverine	n/a	III	7.26	0.49	1.32
U	PUS	depressional	III	III	0.35	0.00	0.00
2015 - 9	PEM/PUS	depressional/riverine	n/a	III	5.03	0.08	1.03
2015 - 10	PFO/PEM	depressional	n/a	III	0.78	0.64	0.63

[a] Wetland identifier – Wetland names retained from 2005 WDR, wetlands added to the inventory during 2015 field work have names with a 2015 prefix

[b] NWI Class based on vegetation: PFO = palustrine forested, PSS = palustrine scrub-shrub, PEM = palustrine emergent, PUS = palustrine unconsolidated shore (for this project PUS = wetlands in active agricultural crop); (Cowardin, Carter, Golet and others 1979)

[c] Ecology rating (Hruby2004; Hruby 2014). An "n/a" designation indicates the wetland was not identified in the 2005 WDR

[d] Category and buffer widths from appropriate local ordinances (Pierce County 2017; Milton 2017; Fife 2017; Puyallup 2017). An "n/a" indicates the wetland was previously unidentified in the 2005 WDR. All buffer information is subject to change following future wetland rating.

Wetland[a]	Cowardin[b]	HGM	ECY[c] & local[d] Rating 2005	ECY[c] & local[d] Rating 2015	Size (ac)	Impact 2015	Buffer Impact
2015-17	PFO/PSS	depressional	n/a	III	0.54	0.00	0.00
2015-18	PFO/PEM	depressional	n/a	III	0.86	0.36	0.78
AA	PFO/PEM	depressional	III	III	0.57	0.00	0.00
BB	PFO	riverine	II	II	0.84	0.00	0.00
CC	PFO/PEM	riverine	III	III	0.52	0.00	0.00
DD	PEM	depressional	III	III	0.66	0.00	0.00
EE	PFO/PEM	depressional	III	III	0.37	0.19	0.70
GG	PFO	depressional	III	III	1.8	0.00	0.03
HH	PFO/PEM	depressional	III	III	1.51	0.26	0.50
LL	PFO	depressional	III	III	2.02	1.94	2.28
2015-13	PFO	riverine	n/a	III	1.25	0.00	0.00
2015-14	PEM	depressional	n/a	III	0.30	0.00	0.00
2015-15	PFO/PEM	depressional	n/a	III	0.74	0.00	0.00
1	PEM	riverine	III	III	3.2	0.44	1.67
2	PEM	depressional	III	III	1.25	0.00	0.00
3	PEM	depressional	III	III	1.6	0.00	0.00
4	PSS/PEM	riverine	III	III	1.5	0.00	0.00
5	PEM	riverine	III	III	0.35	0.08	0.62
2015 - 11	PFO	riverine	n/a	III	0.07	0.07	0.61
2015 - 12	PEM	depressional	n/a	III	0.09	0.09	0.61
6	PEM	riverine	III	III	1.3	0.49	2.40
7	PEM	riverine	III	III	0.92	0.91	1.91
8	PFO/PEM	depressional/riverine	III	III	2.36	0.13	2.93
9	PFO/PSS/PEM	depressional/riverine	III	II	66.56	3.03	12.49
2015-16	PFO/PEM	depressional	n/a	II	4.46	0.00	0.00
11	PFO/PSS	depressional/riverine	II	II	3.89	0.00	0.00
13	PSS/PEM	depressional/riverine	III	II	8.17	0.00	0.00
14	PSS	depressional	III	III	0.92	0.00	0.00
15	PSS/PEM	depressional	III	III	0.14	0.00	0.00
					Total	24.83	50.39

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Potential operational impacts of the proposed SR 167 Project Phase 1 Improvements to wetlands are not meaningfully different and will not exceed those discussed in the 2006 FEIS. Implementation stormwater Best Management Practices (BMPs) will substantially reduce the potential for operational impacts on wetlands. Such BMPs have evolved since the 2006 FEIS with more relative focus on the use of natural terrain and natural dispersion over stormwater ponds but impacts to wetlands should be similar or less than expected in 2006 (WSDOT 2016).

Operational impacts will be limited to those wetlands located immediately adjacent to roadway sections without stormwater collections or compost-amended fill slopes. Sediment and heavy metals retention, and nutrient and toxicant removal are primary functions of many of the wetlands in the project area.

Many of these wetlands lack vegetation, have no vegetated buffers, are intensively farmed, and are located within a relatively developed setting. The wetlands within the corridor that provide higher levels of biological functions are associated with or are near the Hylebos and Wapato Creeks, which is why they received a relatively high wetland rating.

Increased vehicular noise could permanently disturb or deter wildlife from some of the higher quality, proximate wetlands, thereby lowering the wetland's habitat value. However, recent and past site investigations suggest wildlife habitat is not a primary function of most of the wetlands in the immediate corridor.

Indirect Wetland Impacts

Potential indirect impacts of the SR 167 Project Phase 1 Improvements to wetlands are the same as those discussed in the 2006 FEIS and are not considered to be substantial. The proposed project, by substantially improving travel and accessibility, may serve to accelerate short-term planned development in the vicinity of the new freeway interchanges. Some indirect impacts on wetlands may result, but they are anticipated to be limited, consistent with the 2006 FEIS.

The proposed SR 167 Phase 1 Improvements would not be expected to induce unplanned regional growth. However, it may influence the pattern of development within the study area. For instance, the SR 167 Phase 1 Improvements could accelerate the planned transition of some areas in the project vicinity from residential/agricultural to industrial/commercial use or from agricultural/vacant to mixed commercial-residential and industrial. The proposed project could alter the rate, timing, and location of development within the corridor area as planned by local and regional jurisdictions. However, these impacts are consistent with those documented in the 2006 FEIS.

The SR 167 Phase 1 Improvements would provide high quality restoration of streams, riparian wetlands, and riparian uplands from existing habitats that are substantially disturbed and not properly functioning. A substantial increase in wetland area and function is also expected from the riparian restoration of Wapato Creek, Surprise Lake Tributary, and Hylebos Creek. The Riparian Restoration Program (RRP) would convert a substantial area of agricultural land, zoned for industrial and commercial development, into riparian areas and wetlands, which would be protected from development. The RRP remains a project environmental commitment pursuant to the 2006 FEIS and 2007 ROD.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects discussed in the 2006 FEIS remain applicable to the Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than the 2006 Build Alternative. As discussed in Section 3.3.3 of the 2006 FEIS, temporary wetland disturbances are mainly those that will be necessary for implementing the stream relocation and restoration of wetlands within the riparian restoration areas.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Wetlands and aquatic sites are protected under Presidential Executive Order 11990, Protection of Wetlands (President of the United States 1977); the Governor's Executive Order EO 89-10, Protection of Wetlands (Governor of the State of Washington 1989); and WSDOT Policy Statement 2038.00. These orders and directives require the use of all practicable measures to avoid impacts and provide mitigation for any avoidable impacts. As similarly described in the 2006 FEIS, the executive orders stipulate that all state agencies shall use the following definition of mitigation, and in the following order of preference:

1) Avoid
2) Minimize
3) Rectify
4) Reduce impact over time
5) Compensation including the purchase of credits from a mitigation bank or in-lieu-fee (ILF) program.
6) Monitoring the impact and compensation and taking corrective measures.

The 2006 FEIS further describes the likely wetland mitigation ratios to be applied, types of mitigation that could be conducted, and includes a list of potential mitigation sites where mitigation could be performed. Although the ultimate wetland mitigation solutions to be implemented for this project may not differ meaningfully from those proposed in 2006, there have been a number of changes in wetland regulatory context and guidance since 2006.

In 2008, the USACE and EPA published a document known as the 2008 Federal Rule. Section 332.3(b) describes the preferred measures for compensatory mitigation that this project would be expected to follow:

1) Mitigation Bank Credits
2) ILF Program Credits
3) Permittee-responsible Mitigation Under a Watershed Approach
4) Permittee-responsible Mitigation Through Onsite and In-Kind Mitigation
5) Permittee-responsible Mitigation Through Off-site and/or Out-of-Kind Mitigation

Given these mitigation preferences, and the absence of a mitigation bank or ILF program in the area, Permittee Responsible Under a Watershed Approach would be the next preferred option following the guidance provided in the 2008 document *Selecting Wetland Mitigation Sites Using a Watershed Approach* (Ecology 2008). Guidance on wetland mitigation ratios and other mitigation implementation elements would be applied using *Wetland Mitigation in Washington State, Version 1*, a two-part interagency document providing guidance on wetland mitigation (USACE, Ecology 2006).

Detailed development of a wetland mitigation strategy for the Phase 1 Improvements is intended to be included in a separate Conceptual Mitigation Plan Proposal. As part of that effort, the list of potential mitigation sites included in the 2006 FEIS will be thoroughly reevaluated. It is anticipated that a similar but likely shorter list of mitigation sites will be considered for the new proposed Phase 1 Improvements. It is plausible that some of the sites identified in 2006 may no longer be available and/or viable mitigation areas. An overall wetland mitigation solution for Phase 1 will be possible even with a subset of the 2006 sites since the overall mitigation requirement should be considerably less than reported in the 2006 FEIS.

Environmental Commitments

There are a number of wetland related commitments included in the 2006 FEIS and associated Record of Decision (2007) that still apply (or apply with slight modification consistent with current standards) to the 167 Phase 1 Improvements.

Avoidance and Minimization: Potential opportunities to incorporate additional avoidance and minimization include (but are not limited to):

- Making minor changes to the design alignment;
- Using steeper fill slopes;
- Using retaining walls to eliminate fill slopes;
- Retain hydrologic connection between wetlands bisected by the highway.

Wetland Delineations:

- Before initial permitting or preparing a final wetland mitigation plan, WSDOT intends to delineate and categorize all wetlands affected by this project.

Final Wetland Mitigation Plan:

- A final wetland and stream mitigation plan will be developed for this project. Mitigation for unavoidable wetland and wetland buffer impacts resulting from the 167 Phase 1 Improvements will be fully mitigated in accordance with applicable federal, state, and local regulatory requirements.

8. Conclusion

Although changes in the SR 167 Completion Project's corridor such as the fallowing of some agricultural lands, increased impervious surface, and other factors seem to have contributed to a net increase in wetland area, the expected wetland impact acreage of the proposed Phase 1 Improvements is less than the 2006 FEIS Build Alternative. This is due to the relatively smaller footprint of the Phase 1 design. Correspondingly, the mitigation requirement for the Phase 1 Improvements are anticipated to be lower than that of the 2006 FEIS Build Alternative, with further details to be included in a subsequent Compensatory Mitigation Proposal.

References

[BLM] Bureau of Land Management. 2017. Watershed Boundaries Washington HU 5th Level. Portland (OR). [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Brinson MM. 1993. A hydrogeomorphic classification for wetlands. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report WRP-DE-4.

Cowardin LM, Carter V, Golet FC, LaRoe ET. 1979. Classification of wetlands and deepwater habitats of the United States. Washington (DC): US Fish and Wildlife Service. FWS/OBS-79/31.

[Ecology] Washington State Department of Ecology [Internet]. 2017. Converting scores for categories and function scores between the 2004 and 2014 rating systems. [cited 2017 Nov 2] Available from: http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/2014updates.html

[Ecology] Washington State Department of Ecology. 2000. Water Resource Inventory Areas. Olympia (WA). [Accessed from WSDOT Environmental Workbench 2015 Sept 28].

Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available from: http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf

[ESRI] Environmental Systems Research Institute. 2017. ESRI Imagery Basemap (aerial photos). Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

[FGDC] Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington D.C. Available from: http://www.fgdc.gov/standards/projects/FGDC-standards-projects/wetlands/nvcs-2013

[Fife] City of Fife [Internet]. 2017. Fife Municipal Code. Title 17 Environmental Protection. Chapter 17.15 Fish and Wildlife Habitat Conservation Areas and Chapter 17.7 Wetlands. [cited 2017 Nov 2]. Available at: http://www.codepublishing.com/wa/fife/

Hruby T. 2004. Washington State wetland rating system for Western Washington - Revised. Washington State Department of Ecology Publication # 04-06-025. Available from: https://fortress.wa.gov/ecy/publications/SummaryPages/0406025.html

Hruby T. 2014. Washington State wetland rating system for Western Washington – 2014 Update. Washington State Department of Ecology Publication # 14-06-029. Available from: https://fortress.wa.gov/ecy/publications/SummaryPages/1406029.html

[Milton] City of Milton [Internet]. 2017. Municipal Code. Title 18 Environment. Chapter 18.16 Critical Areas. Article II Wetlands and Article V Fish and Wildlife Habitat Conservation Areas. [cited 2017 Nov 2]. Available at: http://www.codepublishing.com/wa/milton/

[NOAA] National Oceanic and Atmospheric Administration [Internet]. 2017. Northwest Regional Office website. ESA salmon listings. Available from: http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/salmon_and_steelhead_listings.html

[NRCS] Natural Resource Conservation Service [Internet]. 1997. Hydrology Tools for wetland determination. Chapter 19 in Engineering Field Handbook. Fort Worth (TX): US. Department of Agriculture, NRCS. Available from: http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17556.wba

[NRCS] Natural Resources Conservation Service [Internet]. 2017a. Field Office Technical Guide. US Department of Agriculture. Climate Data for Pierce County, Station McMillin Reserviour, Washington 455224. [cited 2017 Nov 2]. Available at: http://agacis.rcc-acis.org/53053/mtot

[NRCS] Natural Resources Conservation Service [Internet]. 2017b. National List of Hydric Soils: Pierce County (WA). [cited 2017 Nov 2]. Available from: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/

[NRCS] Natural Resources Conservation Service [Internet]. 2017c. Official Soil Series Descriptions. [cited 2017 Nov 2]. Available from: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/geo/?cid=nrcs142p2_053587

[NRCS] Natural Resources Conservation Service. 2017d. Soil Survey Geographic Database for Washington (SSURGO), Map Units. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Null WS, Skinner G, Leonard W. 2000. Wetland functions characterization tool for linear projects. Olympia (WA): Washington State Department of Transportation, Environmental Affairs Office. Available from: http://www.wsdot.wa.gov/NR/rdonlyres/B92BE0D4-9078-4EFC-99DA-3C0EA4805E2F/0/bpjtool.pdf

Personal Communication. 2015. Email and phone exchange with Chris Larson at City of Fife and Tatiana Dreisbach at WSDOT on 8Dec2015 regarding stream buffers in City of Fife.

Pierce County [Internet]. 2017. Pierce County Charter. Title 18E Development Regulations – Critical Areas. Chapter 18E.30 Wetlands and Chapter 18E.40 Regulated Fish and Wildlife Species and Habitat Conservation Areas. [cited 2017 Nov 2]. Available at: http://www.codepublishing.com/WA/PierceCounty/#!/html/PierceCounty18E/PierceCounty18E.html

Pierce County. 2009. Pierce County GIS Data June 2009. Hydrography, Floodplains, & Watersheds. Watershed layer. [Accessed from WSDOT Environmental Workbench 2015 Sept 23]

[Puyallup] City of Puyallup [Internet]. 2017. Puyallup Municipal Code. Title 21 Environment. Chapter 21.06 Critical Areas. Article IX Wetlands and Article X Fish and Wildlife Habitat Areas. [cited 2017 Nov 2]. Available at: http://www.codepublishing.com/wa/puyallup/

[Tacoma] City of Tacoma [Internet]. 2017. Municipal Code. Title 13 Land Use Regulatory Code. Chapter 13.11 Critical Areas Preservation. [cited 2017 Nov 2]. Available at: http://cms.cityoftacoma.org/cityclerk/Files/MunicipalCode/Title13-LandUseRegulatoryCode.PDF

[USACE] US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. Wakeley JS, Lichvar RW, Noble CV. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available from: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp2.pdf

[USACE] US Army Corps of Engineers. 2009. Department of the Army reference NWS-2008-1445.

[USFWS] US Fish and Wildlife Service. 1996. National Wetland Inventory. US Department of the Interior. [Accessed from WSDOT Environmental Workbench 2015 Sept 28]. Available from: http://www.fws.gov/wetlands/data/index.html

[USFWS] US Fish and Wildlife Service [Internet]. 2017. Species Report. Listing and Occurrences for Washington. [cited 2017 Nov 2] Available from: http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=WA&s8fid=112761032792&s8fid=112762573902

[USGS] US Geological Survey. 2017. 7.5 Minute Quadrangle Map. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10 (Ecology, USACE, & EPA). 2006. Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Version 1). Washington State Department of Ecology Publication #06-06-011b. Olympia, WA. [March 2006] http://www.ecy.wa.gov/pubs/0606011b.pdf.

[WDFW] Washington State Department of Fish and Wildlife. 2017a. Fish Distribution. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

[WDFW] Washington State Department of Fish and Wildlife. 2017b. Priority Habitats and Species Program. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

[WDFW] Washington State Department of Fish and Wildlife. 2017c. Wildlife Occurrence Points. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

[WDNR] Washington Department of Natural Resources. 2017. Forest Practices Water Type Code. [Accessed from WSDOT Environmental Workbench 2017 Nov 2]. Available from: http://www.dnr.wa.gov/forest-practices-water-typing and http://apps.leg.wa.gov/WAC/default.aspx?cite=222-16-030

[WNHP] Washington State Natural Heritage Program. 2017. Plant Heritage. [Accessed from WSDOT Environmental Workbench 2017 Nov 2].

[WSDOT] Washington State Department of Transportation and Federal Highways Administration. November 2006. SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation.

[WSDOT] Washington State Department of Transportation & CH2MHill. May 6, 2005. Final State Route 167 Tier II EIS Wetlands Discipline Report. Prepared by WSDOT OR EHS Office – Olympia, and CH2M Hill – Bellevue, Washington.

[WSDOT] Washington State Department of Transportation. January 26, 2018. SR 167 Completion – Wetland Discipline Report Plan Sheets. WSDOT Olympic Region. Tumwater, WA

[WSDOT] Washington State Department of Transportation. November 2016. Wetland Inventory Technical Memorandum, SR 167 Extension Project – Puyallup to SR 509. Prepared by WSDOT OR EHS Office – Olympia, Washington.

[WSDOT} Washington State Department of Transportation. 2016. Highway Runoff Manual – Supplement February 2016 [M 31-16.04]. Olympia, WA

Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements Vicinity Map



Attachment C –Wetland Location Maps

SR 167 Completion Project- Phase 1

WETLAND TECHNICAL MEMORANDUM

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SCALE IN FEET

Washington State
Department of Transportation

Last Revised: 1/26/2018



LOWER PUYALLUP BASIN

LEGEND

RIPARIAN RESTORATION

BASIN BOUNDARIES

2006 WETLANDS AND BUFFERS — M

2017 WETLANDS AND BUFFERS — M

CUT LINE — CUT

FILL LINE — FILL

Subject to Revision

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SR 167 Completion Project- Phase 1

WETLAND TECHNICAL MEMORANDUM

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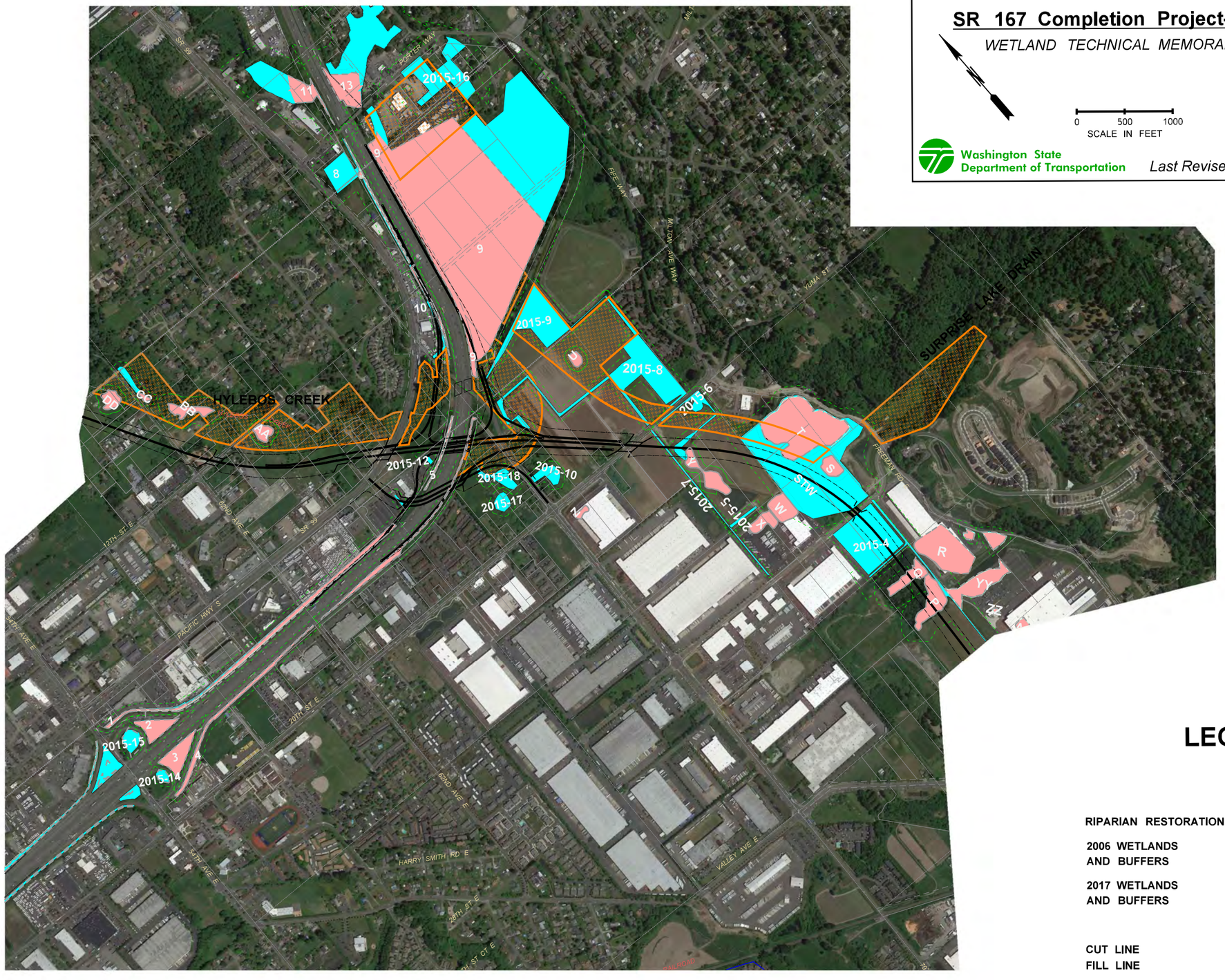
Washington State Department of Transportation

Last Revised: 1/26/2018



LEGEND

RIPARIAN RESTORATION	
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2017 WETLANDS AND BUFFERS	M
CUT LINE	CUT
FILL LINE	FILL

HYLEBOS BASIN

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SR 167 Completion Project- Phase 1

WETLAND TECHNICAL MEMORANDUM

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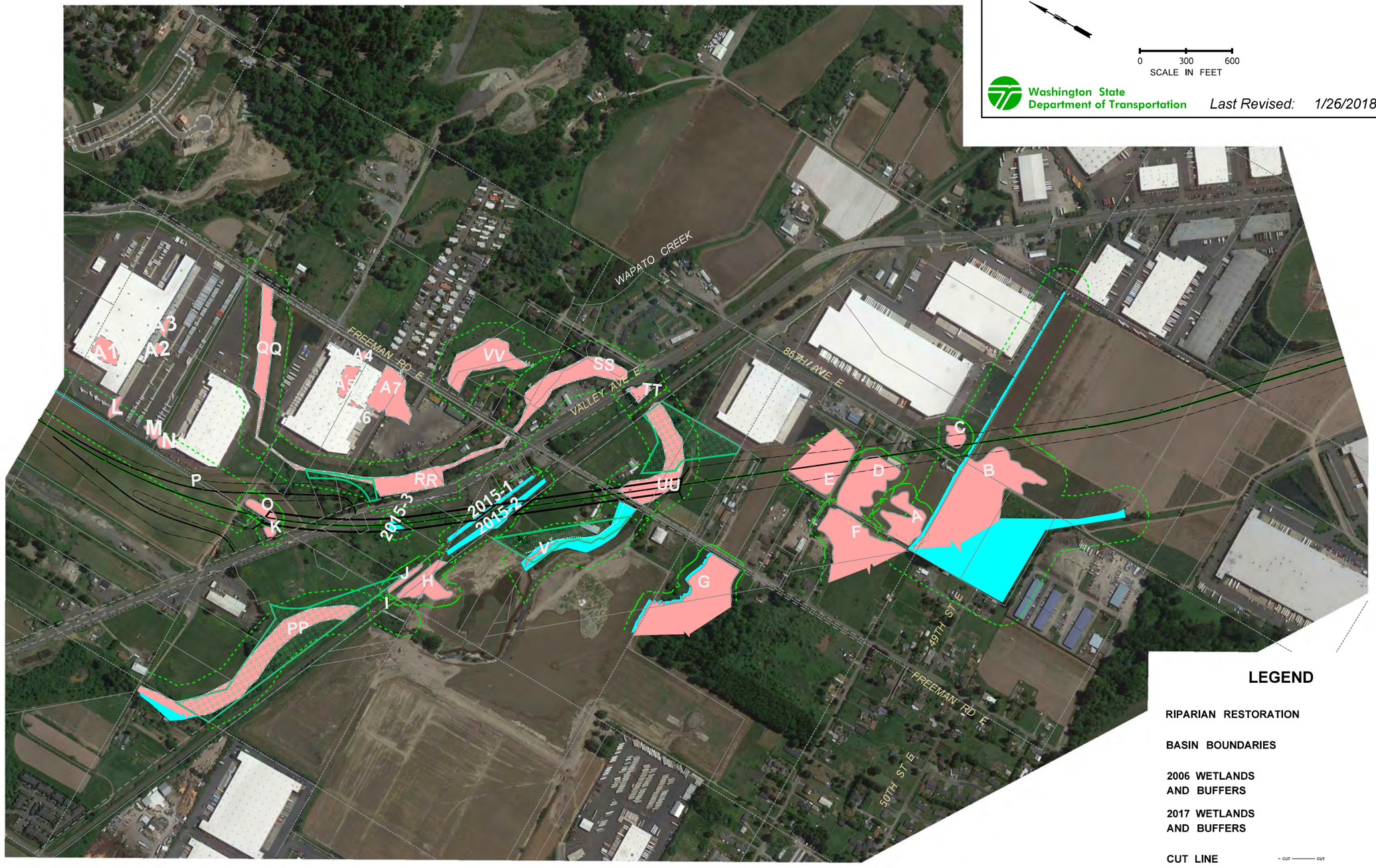
Washington State Department of Transportation

Last Revised: 1/26/2018



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WAPATO BASIN

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WETLAND TECHNICAL MEMORANDUM

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BASIN BOUNDARIES
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Wildlife, Fish, Vegetation, Threatened and Endangered Species

COPY TO:	**Project File**
PREPARED BY:	**Mark Bakeman, WSDOT Biologist, HQ Environmental Services Office, formerly OR EHS Office**
DATE:	**July 19, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to wildlife, fish, vegetation, and Threatened and Endangered Species.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley	6 lanes (152-ft): 2 GP lanes + HOV lane in each	4 lanes (78-ft): 2 GP lanes in each direction, 60

Avenue	direction, 60 MPH posted speed	MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond on-ramp and off-ramp	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

The 2006 FEIS was supported by previous studies including the Wildlife, Fish, Threatened and Endangered Species Discipline Report (DEA and WSDOT, May 2005), and the 1999 TIER I FEIS in regards to amphibians, birds and terrestrial wildlife. These documents detailed possible or known occurrences of numerous species, habitats that may be present, and further details on possible impacts to birds protected by the Migratory Bird Treaty Act (MBTA). These reports gathered species data from the Washington Department of Fish and Wildlife (WDFW), U.S. Fish and Wildlife Service (USFWS), National Oceanographic and Atmospheric Administration National Marine Fisheries Service (NMFS), Puyallup Tribe of Indians (PTOI), and local experts for a comprehensive assessment of habitats and wildlife.

For this (2018) update, the 2005 Wildlife, Fish, and Threatened and Endangered Species Discipline Report and the 2006 FEIS were reviewed to determine if they adequately analyzed the new proposed Phase 1 Improvements alignment and right-of-way (ROW), and possible impacts to habitat and habitat connectivity. In March 2018, Kelly McAllister (WSDOT HQ ESO Habitat Connectivity Biologist) reviewed the habitat connectivity section of the 2005 report and determined that it remained applicable for the proposed Phase 1 Improvements alignment.

The typical assemblage of bird species known or presumed to use the analysis area has had minor changes since the completion of the 2006 FEIS documentation. The USFWS offers a more recent on-line system for assessing listed species and migratory birds within a defined area called "Information for Planning and Consultation" (IPaC). IPaC was consulted for this assessment (IPaC 2018) and returned a list of thirteen migratory birds of conservation concern that could occur in the proposed Phase 1 Improvements area. Eight of these birds were not evaluated in the DEA and WSDOT 2005 Report or 2006 FEIS. The eight new species are:

- Red-throated Loon;
- Long-billed Curlew;
- Golden Eagle;
- Marbled Godwit;
- Semipalmated Sandpiper;
- Black Turnstone;
- Whimbrel; and
- Clark's Grebe.

The IPaC system is not intended to provide fine-grained information on migratory birds, but lists birds that could or might occur in the user-defined area.

Records for these species in the proposed Phase 1 Improvements area were checked through "eBird" (eBird 2018), an on-line tool (managed by the Cornell Lab of Ornithology), which lists bird sightings by geographic location and date. These records help determine if the species is common/rare and if it is present during the breeding season. A summary of eBird results for the 2018 update of the proposed Phase 1 Improvements area are below:

Red-throated Loon - There are a few records of this species in the Hylebos Waterway and in Commencement Bay during spring, fall and winter months. These are migratory individuals and there is no breeding here. There are no records for the bird in the project area. This species is unlikely to be affected by the project.

Long-billed Curlew - There are no recent records in the project area or Commencement Bay. This species is unlikely to be affected by the project.

Golden Eagle - There are no recent records in the project area or Commencement Bay. There are very few records of golden eagle within the Puget Sound region; they are found more commonly in less developed inland habitats with nearby cliffs. This species is unlikely to be affected by the project.

Marbled Godwit - There are no recent records in the project area or Commencement Bay. This species is unlikely to be affected by the project.

Semipalmated sandpiper - There are several records of this species in wetlands and ponds in the project area and surroundings. Records generally were from late summer, but there are several mid-summer records as well. This species has a complex migration pattern in Washington with adults showing up in Washington on the southern migration as early as June (Wahl et al. 2005), with breeding on the northern tundra of Alaska and Canada. Semipalmated sandpiper could be present in the project area during construction.

Black Turnstone - There are several records of this species in Commencement Bay in the fall and winter, and a few records in the Hylebos Waterway west of the project area. These are migratory/wintering individuals and there is no breeding here. There are no records in the project area. This species is unlikely to be affected by the project.

Whimbrel - There are a few records of this species at Dash Point State Park and a single record within the project area at a pond near 70th Avenue and I-5. All records are from spring or fall during migration. Some birds are non-breeding summer residents in Western Washington (Wahl et al. 2005). This species is unlikely to be affected by the project.

Clark's Grebe - There are winter records of Clark's grebe in Commencement Bay and at Dash Point State Park. There are no records in the project area. This species is unlikely to be affected by the project.

In summary, none of the additional bird species identified by the USFWS as migratory species of concern breed in the proposed Phase 1 Improvements project area. All are either migratory within the project area or there are no recent records of them within the project area.

Pursuant to 2007 ROD commitments, pre-construction monitoring for migratory birds will be conducted by WSDOT. Since issuance of the 2006 FEIS, WSDOT has worked with the U.S. Fish and Wildlife Service Migratory Bird Treaty (USFWS MBTA) Office and has completed a "Bird Conservation Plan" (WSDOT 2016), with approval by the USFWS MBTA Office. The primary objective of the Bird Conservation Plan is to determine appropriate project-specific methods to avoid and minimize project effects to nesting birds. Although incidental take is no longer a focus of USFWS enforcement of the MBTA (U.S. Department of the Interior, 2017), WSDOT will continue to promote the goal of minimal impacts to nesting birds through the use of the Bird Conservation Plan.

The 2006 FEIS and 2007 ROD addresses wildlife connectivity, and had been previously addressed in Pierce County through analysis of a BioDiversity Network Plan (Brooks et al. 2004). Habitat modeling identified areas across the landscape that were identified for species richness and representation for each of the taxonomic groups in the study (mammals, birds, amphibians, and reptiles). These core polygons were buffered by 0.25 mile and were referred to as Biodiversity Management Areas (BMAs). The BMAs were connected by linear movement corridors. The Puyallup River was mapped as a connecting corridor, as it serves as an important waterway that connects anadromous fish from Puget Sound to freshwater spawning habitats farther up in the watershed. It was not identified as an important corridor for terrestrial wildlife in the lower watershed, and there were no BMAs (core polygons) in the project area.

Subsequent to 2006, wildlife connectivity within the project area has been addressed in the following ways:

- All stream crossing culverts/bridges will be designed to allow for fish passage, according to the latest WDFW design criteria (Barnard et al. 2013). Seven new crossing structures will provide full fish passage and seven additional crossings will be widened or replaced by the proposed Phase 1 Improvements. These structures will allow for continued fish passage on stream segments that formerly did not have structures, or provide additional fish passage into upstream habitats if a former structure was a partial or complete barrier to fish. Since stream simulation requires the use of wider structures to allow for channel migration within the floodplain (and the structures are often taller as well), the new structures also provide additional movement opportunities for terrestrial wildlife under roads. In other study areas, WSDOT biologists have monitored several culverts with trail cameras prior to and after replacement with stream simulation structures, and terrestrial wildlife passage often increases immediately after the new structure is installed (personal communication Kelly McAllister 2018).
- The Riparian Restoration Program (RRP) will improve wildlife habitat connectivity along some of the last remaining natural habitats in the proposed Phase 1 Improvements area. 8,880 feet of stream in the Hylebos basin will be restored and relocated and an additional 5,100 feet of stream in two basins restored but not relocated. Additionally, 110 acres of riparian buffer restoration will occur in two basins. Although there will be temporary impacts to wildlife movement during construction, these riparian habitats will likely become the primary wildlife movement corridors in this rapidly urbanizing landscape.
- Existing at grade movement corridors for terrestrial wildlife will be maintained under the proposed Phase 1 mainline Improvements, by elevating some of the new highway sections. There are two major cases where this applies. The more important examples are in the area where there is currently no highway on the north side of the Puyallup River, and terrestrial wildlife are able to access the river without encountering a highway barrier. Placement of the new SR 167 corridor on the north side of the river will partially block movement, but elevated highway sections at SR 167/Valley interchange and the SR 167/SR 161 interchange will allow wildlife permeability through SR 167. The Valley interchange will have the following clearances; 1) SR 167 elevated over Valley Avenue by 24.5 feet, 2) SR 167 elevated over the Union Pacific Railroad by 23.5 feet, 3) SR 167 elevated over Wapato Creek by 31 feet. These clearances are all well within a recommended 10 foot clearance for deer (the largest mammal in the project area), although deer will pass under structures shorter than 10 feet (K. McAllister personal communication 2018). This elevated section will help maintain an important permeable riparian zone for terrestrial wildlife movements along Wapato Creek. The mainline of SR 167 will also be elevated over SR 161 (North Meridian). The interchange will be just north of the Puyallup River and is in an already developed area, especially to the east. There is more agricultural land to the west of this interchange, but much of this area has been converted to warehouses and is not anticipated to be an important wildlife area.

  A second group of elevated structures will occur in several locations where there are existing local roads/state highways. Terrestrial wildlife may currently be crossing these existing roadways with some success. By elevating the new project roadway segments over the existing roads, there will be no additional blockages to wildlife movement, although increased noise may alter wildlife behavior in these areas. Elevated sections of new roadway over existing roadway

will occur in the lower Hylebos area west of I-5; the new SR 509 spur will be elevated over SR 509, 54th Avenue, and 12th Street E, and SR 167 will be elevated over SR 99. In the area east of I-5 SR 167 will be elevated over 20th Street E and 26th Street E.

I-5 at the proposed SR 167 intersection is likely a major barrier to east-west wildlife movement, with the paved highway about 170 feet wide. There will be no work to change the profile of I-5, but culverts under I-5 on Hylebos Creek will be widened for fish passage. These wider structures should also provide at least seasonal passage for terrestrial wildlife species and improve wildlife permeability through I-5.

Threatened and Endangered Species
Fish and Critical Habitat

Subsequent to issuance of the 2006 FEIS, Chinook Salmon of the Puget Sound Evolutionarily Significant Unit (ESU) (designated critical habitat) and Bull Trout of the Coastal/Puget Sound Distinct Population Segment (DPS) (proposed critical habitat) were listed under Section 7 of the Endangered Species Act.

Three additional fish and/or critical habitat listings have occurred since the completion of the 2006 FEIS. These include Puget Sound Steelhead and both Puget Sound Steelhead and Puget Sound Bull Trout critical habitat. Although an additional fish species has been listed and two fish critical habitats have been designated, the Phase 1 Improvements reduce impacts to aquatic listed species and critical habitats.

4. Would the Phase 1 Improvements result in any new or significant impacts?

Threatened and Endangered Species
Wildlife

In the 2006 FEIS, impacts to wildlife were determined through several qualitative and quantitative methods, including using Geographic Information System (GIS) layers, consulting with local experts, reviewing published reports, and detailed surveys for some resources (e.g. wetlands) (David Evans and Assoc. 2005). The Endangered Species Act (ESA) analysis focused on specific project effects of the SR 167 Extension project to listed species and designated critical habitats. The effects of the 2006 Build Alternative were evaluated as follows:

> "The Build Alternative's potential impacts on fisheries, wildlife, and habitat were evaluated quantitatively and qualitatively by assessing the potential effects of the construction and operation of the highway on habitats and water resources. Impacts to wildlife and habitats within the SR 167 corridor were assessed primarily by determining the degree of habitat removal and restoration that would occur under the Build Alternative. The amount of habitat that would be disturbed and/or removed was estimated within the study corridor from engineered project design plans prepared for the project." (pp. 13-14)

The 2006 FEIS concluded that based on the project Biological Assessment and subsequent consultation with USFWS that two animal species and three plant species may have been impacted by the project. At that time, it was determined project completion was "likely to adversely affect" Bull Trout, "not likely to

adversely affect" Bald Eagle and have "no effect" to Marsh Sandwort, Golden Paintbrush and Water Howellia. A detailed description of the effect determination rationale can be found in the 2006 TIER II FEIS.

The 2006 FEIS also determined that although Marbled Murrelets are known to use areas of South Puget Sound for foraging and past breeding evidence has been recorded in eastern Pierce County, that only marginally suitable foraging habitat occurs in Commencement Bay. Therefore, Marbled Murrelets are not expected to forage within the project area; Murrelets do not forage in fresh waters. The 2006 FEIS went on to determine that a portion of the study area could be used as a daily migratory route between foraging and nesting locations. There is no suitable nesting habitat in the study area and no documented biotic detections.

Murrelet occurrence data were re-examined as part of the 2018 reevaluation, considering the new proposed Phase 1 Improvements area. WDFW maintains a Priority Habitats and Species (PHS) database, which showed there are no recent records of Murrelets in or near the project area (PHS 2018). A check of eBird records showed winter and spring occurrences of foraging Murrelets in Commencement Bay, but none in the project area. WDFW also revised the Washington State's status of the Murrelet from threatened to endangered in February 2017, based on the continued decline in Washington Murrelet populations.

The USFWS has listed several new species since the original 2007 consultation including Mazama Pocket Gopher (listed 2014, 50 CFR Part 17 19760-19796 and 19712-19757), Yellow-billed Cuckoo (listed 2014, 50 CFR 17 59992-60038), Streaked Horned Lark (listed in 2013, 50 CFR 17 61506-61589), Taylor's Checkerspot Butterfly (listed 2013, 50 CFR 17 61452-61503), and Oregon Spotted Frog (listed 2014, 50 CFR 17 51658-51710). Some of these have the potential to occur within the proposed Phase 1 Improvements project area.

Since the 2006 FEIS was completed, USFWS has implemented the IPaC system for generating lists of species that may occur in the vicinity of a project. In November 2017, the IPaC website was accessed and queried for an updated list of threatened and endangered species protected by the ESA and other sensitive species that "could" (see further discussion below) be impacted by the proposed Phase 1 Improvements alignment. The IPaC ESA list included Bull Trout, Marbled Murrelet, Streaked Horned Lark, Yellow-billed Cuckoo (status of these species is currently Threatened) and North American Wolverine (proposed Threatened).

The USFWS also revised the process to evaluate Murrelet habitat in 2014, starting with a GIS layer of potentially suitable Murrelet habitat (Davis et al. 2016). This GIS layer showed a small potentially suitable habitat along Hylebos Creek, however additional field visits found no suitable nesting habitat for Marbled Murrelet. Likewise, no suitable habitat was found for Streaked Horned Lark, Yellow-billed Cuckoo or North American Wolverine within the proposed Phase 1 Improvements vicinity.

Fish

Suitable habitat for bull trout does occur within the project action area in the Puyallup River, and consistent with the 2006 FEIS Build Alternative, Phase I will have a likely to adversely affect determination for Bull Trout. The proposed Phase 1 Improvements project will also adversely affect Puget Sound (PS) Chinook and critical habitat. A previous re-initiation in 2012 had added Pacific Eulachon (informal determination) and PS Steelhead (formal determination) to the consultation in 2012. PS Steelhead critical habitat was designated in 2016 (CFR V81 No 26 9252-9325), and the project will reinitiate with the NMFS and has added this critical habitat to the ESA consultation with an adverse

effect determination. The USFWS consultation will be updated with new proposed Phase 1 Improvements information, but re-initiation will not be required.

There has been no change in the federal status of ESA listed fish or critical habitats since the original consultation with the exceptions listed in the previous paragraphs. The NMFS is planning on producing a draft Recovery Plan for PS steelhead in 2018, with a final plan anticipated in 2019. NMFS has produced an outline of the plan (NMFS NW Region 2013), which indicates a high probability of extinction (90% probability within 25-30 years) for Puyallup River winter run Steelhead.

Implementation of the proposed Phase 1 Improvements will substantially decrease the overall impacts to fish in the project area in comparison to the impacts of the 2006 FEIS Build Alternative. All temporary stream crossings will be eliminated, the number of new stream crossings will be reduced and additional stream crossings will be removed or improved for fish passage. Since the 2006 FEIS, the WDFW has developed new water-crossing design criteria for fish bearing streams. As a result, any culverts that will be replaced for fish passage must now meet strict fish passage criteria (Barnard et al. 2013). Because all WSDOT projects are required to meet these new criteria, the majority of water crossings will be significantly wider structures (i.e. bridges). The proposed Phase 1 Improvements will create and/or restore approximately 2.6 miles of stream habitat, 110 acres of riparian buffer and reduce pollution generating impervious surface, compared to the 2006 FEIS Build Alternative. Riparian habitat improvements will include placement of woody debris in stream channels, removal of invasive plants and revegetation with native plants.

Stormwater pollutants also present risks to fish and their habitats. There is considerably less pollution generating impervious surface (PGIS) under the proposed Phase 1 Improvements alignment (75.6 acres new PGIS), when compared to the 2006 FEIS alignment (FEIS estimate is 258 acres new PGIS). This will result in lower pollutant loads discharged into project area surface waters. Much of the Phase 1 Improvements alignment occurs in ROW (parcel acquisitions) that has already been secured by WSDOT.

Riparian Restoration Program

The Riparian Restoration Program (RRP) remains an integral part of the proposed Phase 1 Improvements. The RRP will serve as an alternative to conventional stormwater flow control Best Management Practices (BMPs), will have multiple wetland mitigation sites nested within the riparian corridors, and will enhance wildlife movement corridors within the project area. The 2006 FEIS outlined RRP elements in three basins: The Hylebos, Surprise Lake, and Wapato.

The RRP will continue to provide many important benefits to wildlife, including enhancing hydrologic connectivity of floodplain wetlands with stream channels, improving habitat features in streams by placement of large woody debris, removal of fish barriers, new or improved stream crossings, removal of stream crossings no longer needed, and removal of invasive vegetation species and replacement with native species. There are some changes in the RRP under the Phase 1 Improvements, mostly in the Wapato basin. The Wapato RRP strategy includes revegetation of the stream banks and riparian areas, but no re-location of the Wapato stream channel. Those changes are primarily driven by reduced impacts under the proposed Phase 1 Improvements due to the elimination of the loop ramp included in the 2006 FEIS Build Alternative. Preliminary design in the Hylebos/Surprise Lake Tributary basins (WSDOT 2008) also provides for a more contiguous riparian corridor than what was described in the 2006 FEIS.

Hylebos Creek

Hylebos Creek restoration will include an additional 3,990 feet under the proposed Phase 1 Improvements (see Table 2 below) of channel improvement to accommodate its planned relocation in and around the footprint of the I-5 interchange. The Hylebos RRP area has been reduced 17.4 acres (Table 2), slightly decreasing the flooded area (less overwintering habitat for fish species).

Wapato Creek

The proposed Phase 1 Improvements have less impact than the 2006 FEIS Build Alternative to Wapato Creek due to a narrower proposed ROW. The impacts have been reduced, resulting in less floodplain fill, and less stream buffer disturbance. The Phase 1 Improvements do not include the large loop ramp described in the 2006 FEIS, and WSDOT will not need to acquire the same amount of property where the loop ramp was formerly proposed. As a result, a property in this basin that was targeted for wetland mitigation and riparian restoration will not be acquired. Therefore much of the riparian restoration discussed in the 2006 FEIS in the Wapato Basin will not be necessary. The Phase 1 Improvements will still include removal of buildings, private roads, culverts, and invasive and noxious weeds, and revegetation with native riparian plant species. However, the stream improvements described in the 2006 FEIS are not applicable for Phase 1 linear stream improvements, shown in Table 2. Likewise, due to the absence of the loop ramp described in the 2006 FEIS, the approximately 21 acres of Wapato RRP is not included under the Phase 1 Improvements (WSDOT 2008b page 2).

Surprise Lake Tributary

The Surprise Lake Tributary improvements under the proposed Phase 1 Improvements have decreased when compared to the 2006 FEIS. Under the Phase 1 Improvements, Surprise Lake Tributary restoration will have approximately 960 feet less (Table 2) improved stream channel when compared to the 2006 FEIS. In addition, 290 pieces of large woody material (LWM) will be installed to further enhance fish habitat. The Surprise Lake Tributary RRP area remains consistent with the 2006 FEIS (Table 2). No additional crossings will be constructed in Surprise Lake Drain.

Table 2. Comparison of Stream Improvements and RRP Buffers - 2006 FEIS Build Alternative and Phase 1 Improvements

	2006 FEIS Length of Stream Restored (ft)	Phase 1 Length of Stream Restored (ft)	2006 FEIS Area of RRP Restored (acre)	Phase 1 Area of RRP Restored (acre)
Hylebos	4010	8,000	87.4	70
Wapato	4790	1,600	73	12
Surprise Lake	5340	4,380	29	28
Total	14,140	13,980	189.4	110

The proposed Phase 1 Improvements reduce impacts compared to the 2006 FEIS Build Alternative, by eliminating all temporary stream crossings, which reduces potential for sedimentation. Fewer new stream crossings also reduces overall additional impacts to the fishery resource (Table 3). As previously detailed, all of the new and replaced crossings of fish bearing streams will be designed to allow for full fish passage.

There will also be new temporary impacts that were not described in the 2006 FEIS, when the existing Hylebos I-5 bridges are widened during construction of the new I-5 Hylebos bridges. Temporary impacts will include additional downstream sedimentation, and temporary loss of aquatic and terrestrial wildlife

connectivity through the existing structures during construction. The new structures will provide for additional aquatic and terrestrial wildlife connectivity under I-5 as previously stated.

Table 3: Comparison of Stream Crossings - 2006 FEIS Build Alternative and Phase 1 Improvements.

Stream Crossing	Total	
	2006 FEIS	Proposed Phase 1
Temporary Crossing	11	0
New Stream Crossing	13	7
Improved or Removed Crossing	19	12

Vegetation

The 2006 FEIS Build Alternative would have resulted in the removal of a maximum of 217 acres of permanent vegetation of varying quality during construction (excluding vegetation in already developed areas (landscaping, etc.), with 92 acres of temporary vegetation impact. Most of the impacted vegetation in the vicinity of the SR 167 corridor is in agricultural fields and residential/commercial/industrial areas. The proposed riparian restoration would enhance approximately 110 acres of native riparian buffer, partially offsetting the permanent vegetative impacts. Native riparian plantings will replace areas currently dominated by invasive weed species, which diminish habitat value for fish and wildlife.

The new proposed Phase 1 Improvements would result in less permanent vegetation impact, 110 acres (David Evans and Associates. 2005, page 45), as compared to the 217 acres under the 2006 Build Alternative, but more temporary impact, 141 (David Evans and Associates. 2005, page 46) versus 92 acres. The temporary impacts increased under the Phase 1 Improvements primarily because of additional riparian restoration planned in the Hylebos Basin.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

The 2006 FEIS identified several operational impacts to wildlife and aquatic resources under the Build Alternative, including:

- Direct loss of wildlife due to wildlife-vehicle collisions;
- Higher levels of noise and light emanating from the highway, both of which can affect wildlife through displacement and altered behaviors, leading to lower fitness;
- An increase in pollutants from the new roadway. Although the stormwater from the new impervious surface will be treated, there will be increased pollutant loads into surface waters;
- Reduced wildlife habitat connectivity in parts of the project area due to the barrier effect of the new road, which will be partially offset by the enhancement of forested riparian corridors, wetland restoration, elevated sections of the roadway that are permeable to wildlife, installation of new fish passable structures and replacement of fish barrier culverts.

- There were many benefits associated with the RRP for both aquatic and terrestrial wildlife from establishment/reestablishment of riparian buffers along 4.4 miles of stream channel, and restoration/enhancement of 189 acres of wildlife habitat.

Operation impacts under the proposed Phase 1 Improvements are anticipated to be less than those described in the 2006 FEIS because the reduced project footprint will result in lower traffic levels, with less noise and light from the roadway. Wildlife/vehicle collisions may or may not decrease. The new highway will likely be a barrier to movement for small and medium sized animals regardless if it is four (proposed Phase 1) or six lanes (2006 FEIS Build Alternative). It may also be a partial barrier to larger mammals (deer, coyote) regardless of the differences in width.

Pollutant loads resulting from the proposed Phase 1 Improvements would be less than described in the 2006 FEIS. The Phase 1 Improvements would result in 76 acres of new PGIS, compared to 258 acres under the 2006 FEIS Build Alternative. The need to treat stormwater from less pollution generating impervious surface in Phase 1 would result in fewer or reduced sized stormwater features and BMPs, and lower pollutant loads into impacted surface waters.

Wildlife connectivity and habitat improvements resulting from Phase 1 would be similar to what was described in the 2006 FEIS, primarily because the RRP will only have minor changes. The wildlife benefits associated with the RRP described in the 2006 FEIS will also be realized as a result of the Phase 1 Improvements.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The 2006 FEIS Build Alternative included 11 temporary stream crossings for construction. All temporary stream crossing will be eliminated in the proposed Phase 1 Improvements. The elimination of temporary stream crossings will significantly reduce the potential of sedimentation and turbidity impacts within the Hylebos, Surprise Lake Tributary, and Wapato watersheds.

Temporary vegetation impacts for the proposed Phase 1 Improvements are calculated based on a 40-foot buffer around a 10-foot offset from the cut and fill line. Cut and fill slope vegetation impacts are considered permanent, although they will be revegetated. Temporary impacts also include the entire RRP area, including 133.0 acres in the Hylebos sub-basin and 7.7 acres in the Wapato sub-basin. Temporary vegetation impact areas include temporary access roads and staging areas, which are revegetated when work is completed at the site. These are worst case estimates based on preliminary project design, and will likely be reduced as the project advances toward final design. Consistent with the 2006 FEIS, revegetated areas of the Phase 1 Improvements will be replanted with native species. Many of the projected disturbance areas currently are covered in invasive species, with reed canary grass common in both the Hylebos and Surprise Lake basins.

There will be greater temporary impacts to vegetation under the proposed Phase 1 Improvements (141 acres) compared to the 2006 FEIS (41 acres), primarily due to planned additional restoration work in the Hylebos drainage.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The mitigation measures as described in Section 3.4.10 of the 2006 FEIS and 2007 ROD remains applicable to the proposed Phase 1 Improvements. These will include additional design refinements to minimize impacts, mitigation for wetland impacts, using fish passable structures, and implementing the RRP. All applicable laws will be considered and complied with as design progresses, and during project construction. FHWA and WSDOT will apply the minimization measures and performance standards resulting from the Biological Assessment, and comply with all Terms and Conditions resulting from ongoing consultation and approval from the USFWS and NMFS. WSDOT maintains a list of environmental minimization measures for the project from the 2007 consultations with the USFWS and the NMFS, and the list is periodically updated as consultation continues.

8. Conclusion

Compared to the 2006 FEIS Build Alternative, the proposed Phase 1 Improvements decreases the impacts to agricultural land, marginal forest and grass/scrub/shrub habitat types, and lessens impact to existing developed areas. The Phase 1 Improvements reduce the overall impacts on the fisheries resource due to a reduction in overall in-water work (i.e. fewer stream crossings). The proposed Phase 1 Improvements would not alter the conclusion of the 2006 FEIS that the SR 167 Project will not result in any new or significant potential adverse effects to fish and wildlife, vegetation, or threatened and endangered species. Consistent with the 2006 FEIS, overall habitat connectivity is expected to be minimally degraded between the remaining forested habitats due to the relative location of these habitats to the proposed Phase 1 Improvements, but will be improved in some areas with the removal of several undersized crossings, utilizing up-to-date fish passage criteria for all new or replaced crossings, and implementation of the RRP.

The design modifications for the proposed Phase 1 Improvements are consistent with the extent of impacts identified in the 2006 FEIS. No additional adverse effects to fish and wildlife, vegetation, threatened and endangered species will result from the Phase 1 Improvements.

References

Barnard, R. J., J. Johnson, P. Brooks, K. M. Bates, B. Heiner, J. P. Klavas, D.C. Ponder, P.D. Smith, and P. D. Powers (2013), Water Crossings Design Guidelines, Washington Department of Fish and Wildlife, Olympia, Washington.

Brooks, K., K.M. Dvornich, M. Tirhi, E. Neatherlin, M. McCalmon, and J. Jacobson. 2004. Pierce County Biodiversity Network Assessment: August, 2004. Report to Pierce County Council, Pierce County, 146 pp in length.

Davis, Raymond J.; Hollen, Bruce; Hobson, Jeremy; Gower, Julia E.; Keenum, David. 2016. Northwest Forest Plan—the first 20 years (1994–2013): status and trends of northern spotted owl habitats. Gen. Tech. Rep. PNW-GTR-929. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 54 pp in length.

David Evans and Associates. 2005. State Route 167, Tier II EIS. Wildlife, Fish Threatened and Endangered Species Discipline Report. Final.

eBird. On-line tracking system for bird records worldwide, created and supported by Cornell Lab of Ornithology. At https://ebird.org/home. Accessed 3/1/18.

FHWA and WSDOT SR 167 Puyallup to SR 509 TIER II Final Environmental Impact Statement and Section 4(f) Evaluation. November 2006.

FHWA and WSDOT. SR 167 Corridor Adoption, Puyallup to SR 509, Pierce County, Washington. TIER I Final Environmental Impact Statement. April 1999.

Information for Planning and Consultation (IPaC). 2018. On-line U.S. Fish and Wildlife Service resource. At: https://ecos.fws.gov/ipac/. Accessed 2/28/18.

McAllister, K. 2018. Personal communication weeks of February 26, 2018 and March 5, 2018. K, McAllister is the WSDOT HQ ESO Habitat Connectivity Biologist.

National Marine Fisheries Service. Northwest Region. 2013. Federal Recovery Outline Puget Sound Steelhead Distinct Population Segment.

Priority Habitats and Species. 2018. Database maintained by Washington Department of Fish and Wildlife. Provided to WSDOT on a quarterly basis. Accessed 3/1/18.

United States Department of Interior. 2017. Deputy Solicitor Memorandum. The Migratory Bird Treaty Act Does Not Prohibit Incidental Take.

Wahl T, B. Tweit, and S. Mlodinow. Editors. 2005. Birds of Washington. Status and Distribution. Oregon State University Press.

Washington State Department of Transportation. 2016. Washington State Department of Transportation Bird Conservation Plan. Prepared by WSDOT Fish and Wildlife Program Staff, Olympia WA.

Washington State Department of Transportation. 2008. SR 167 Extension Project Hylebos Riparian Restoration Program. Preliminary Design Version 1.0.

Washington State Department of Transportation. 2008b. Technical Memorandum from K. Ludwa and H. Ehlert to S. Fuchs. Wapato Riparian Restoration Program Strategy.

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Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Vicinity Map



Air Quality

COPY TO:	**Project File**
PREPARED BY:	**Ginette Lalonde, Lead Air Quality Analyst, WSP USA**
DATE:	**April 11, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the Washington State Department of Transportation (WSDOT) Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to air quality.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

3. What has changed in the affected environment since 2006?

The affected environment relative to air quality as described in Chapter 3.5 of the 2006 FEIS generally remain applicable to the proposed Phase 1 Improvements. This section details certain aspects that have changed since 2006.

WSDOT's affected environment documentation requirements (WSDOT 2017) for air quality analysis include:

- Air quality standards and regulations
- Air quality analysis methodology
- Study area characteristics
- Monitored air quality concentrations

Changes to the affected environment documentation requirements, and changes to the physical environment relative to air quality, are described below.

Air Quality Standards and Regulations

Air quality is regulated by federal, state, and local agencies. The air quality analysis for the 2006 SR 167 Completion Project followed the then current guidelines developed by the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), the Puget Sound Clean Air Agency (PSCAA), and the Puget Sound Regional Council (PSRC).

The Clean Air Act (CAA) is a federal law passed in 1963 and amended in 1967, 1970, 1974, 1977, and 1990. The Clean Air Act Amendments of 1990 and the Final Transportation Conformity Rule (40 CFR Parts 51 and 93) direct EPA to implement environmental policies and regulations that will ensure acceptable levels of air quality.

The CAA and the Final Transportation Conformity Rule affect the funding and approval of proposed transportation projects. According to CAA Title I, Section 176(c)2:

> *No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program or project has been found to conform to any applicable State Implementation Plan (SIP) in effect under this act.*

According to Section 176(c)2(A) of the CAA, conformity to an implementation plan means eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards, and that such activities will not:

- Cause or contribute to any new violation of any NAAQS in any area
- Increase the frequency or severity of any existing violation of any NAAQS in any area
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area

Transportation project conformity is also addressed by the Washington Administrative Code (WAC) in Chapter 173-420, and does not introduce any additional requirements.

Criteria Pollutants

Under the authority of the CAA, the EPA has identified several air pollutants as pollutants of concern nationwide and has established the NAAQS. These pollutants, known as "criteria pollutants," are carbon monoxide (CO), particulate matter with a diameter of 10 micrometers or less (PM_{10}), particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). The NAAQS specify maximum allowable concentrations for these criteria pollutants. Table 2 provides a summary of the current NAAQS.

Table 2. National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead		primary and secondary	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide		primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual mean
Ozone		primary and secondary	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution	$PM_{2.5}$	primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: www.epa.gov/criteria-air-pollutants/naaqs-table. EPA 2016
PMXX = particulate matter size
µg/m^3= micrograms per cubic meter
ppm = parts per million
ppb = parts per billion

Areas that meet the NAAQS are deemed "attainment areas." Areas not in compliance with the NAAQS are deemed nonattainment areas. Areas that were formerly classified as nonattainment areas but have since demonstrated attainment with the NAAQS are classified as maintenance areas. The SR 167 Completion Project is located in an area that is currently designated as a maintenance area for $PM_{2.5}$ and PM_{10}. The project area is currently in attainment for all of the other criteria pollutants (CO, SO_2, NO_2, O_3, and Pb). At the time of the 2006 FEIS, the project area was designated as a maintenance area for Ozone and CO, but in attainment for all of the other criteria pollutants ($PM_{2.5}$, PM_{10}, SO_2, NO_2, and Pb).

Carbon Monoxide (CO)

CO is a colorless and odorless gas that has the potential to affect human health by reducing the oxygen-carrying capacity of the blood. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, and heart disease. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations are typically found near congested roadway intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions. Consequently, CO concentrations are predicted on a localized, or microscale, basis.

Particulate Matter (PM)

Particulate pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. Of particular concern to human health are those particles that are smaller than, or equal to, 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$). Particulates can include smoke, soot, dust, salts, acids, and metals. Particulate pollution also forms when gases emitted from motor vehicles react in the atmosphere.

When inhaled, these particles can damage the respiratory tract. Particles 2.5 to 10 micrometers in diameter tend to collect in the upper portion of the respiratory system, whereas particles 2.5 micrometers or less in diameter are so tiny that they can penetrate deeper into the lungs and damage lung tissue, as well as cross into the bloodstream, thereby affecting other systems in the body.

Ozone (O_3)

O_3 is a colorless toxic gas that when inhaled can irritate and damage the human respiratory system. In particular, individuals with compromised respiratory systems tend to be more susceptible to the effects of ozone. It can also damage plants by inhibiting their growth. Although O_3 is not directly emitted, it forms in the atmosphere through a chemical reaction between reactive volatile organic compounds (VOC) and nitrous oxide/nitrogen dioxide (NO_X). O_3 is also produced from certain industrial sources and automobile emissions.

Nitrogen Oxides

Nitrous oxide and nitrogen dioxide are collectively referred to as NO_X. Nitrogen dioxide (NO_2) is a brownish gas of concern to human health because it irritates the lungs. Like ozone, it can cause adverse respiratory effects. NO_X is formed when nitrogen and oxygen react, generally at high temperatures, such as in vehicle engines. NO_X is a major contributor to ozone formation. Nitrogen dioxide also contributes to the formation of particulate matter. High concentrations of nitrogen dioxide can also result in a brownish-red cast to the atmosphere and reduced visibility.

Lead

Lead (Pb) is a stable element that persists and accumulates in the environment and in animals, including humans. Its principal effects in humans are on the blood-forming, nervous, and renal systems. Lead levels in the urban environment from mobile sources, such as automobiles, have substantially decreased since the federally mandated ban on lead in automobile fuels and switch to unleaded gasoline, and are expected to decrease further over time.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., certain factories or refineries).

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. Controlling air toxic emissions became a national priority with the passage of the CAA Amendment of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (https://www.epa.gov/iris). In addition, EPA identified the following nine compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA):

- **Benzene—**Characterized as a known human carcinogen.
- **Acrolein**—Its potential carcinogenicity cannot be determined because existing data are inadequate to assess the human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde**—A probable human carcinogen based on limited evidence in humans and sufficient evidence in animals.
- **Acetaldehyde**—A probable human carcinogen based on limited evidence in humans and sufficient evidence in animals.
- **Ethylbenzene—**Determined by EPA as not classifiable as to human carcinogenicity. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood.
- **1,3-butadiene**—Characterized as carcinogenic to humans by inhalation.
- **Diesel Exhaust**—Likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust is the combination of diesel particulate matter (DPM) and diesel exhaust organic gases. Exposure to diesel exhaust can cause chronic respiratory effects; this is possibly the primary non-cancer hazard from MSATs. Prolonged exposure may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis.
- **Naphthalene**—Classified as a possible human carcinogen by EPA. Acute exposure of humans to naphthalene by inhalation, ingestion, and dermal contact is associated with hemolytic anemia,

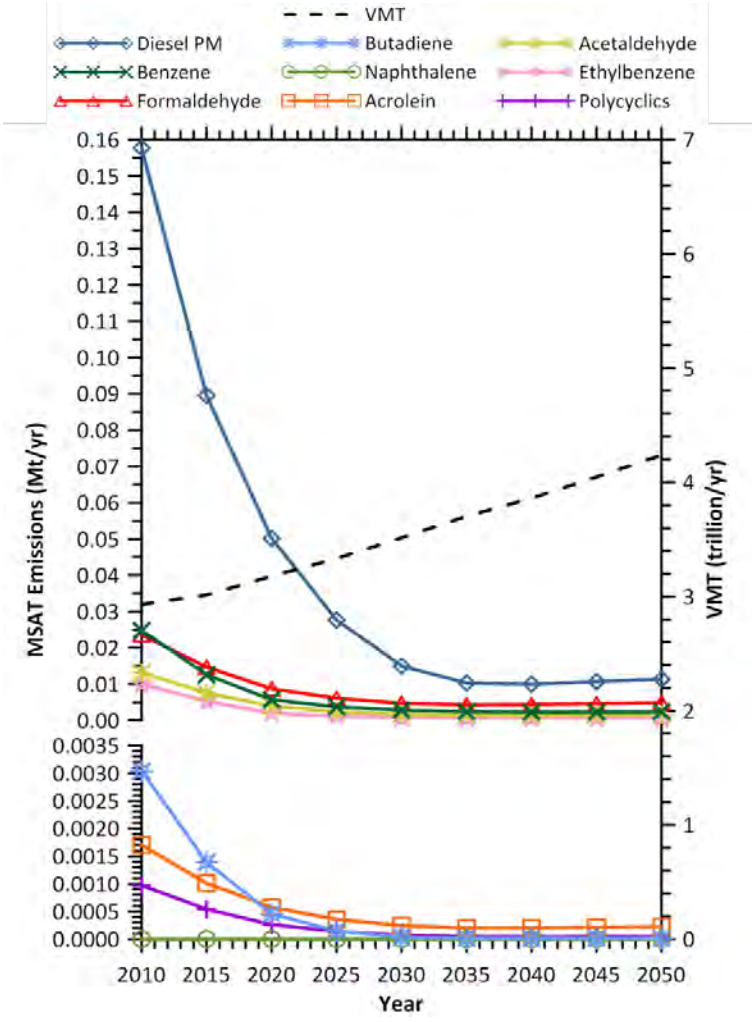
damage to the liver, and neurological damage. Cataracts have also been reported in workers acutely exposed to naphthalene by inhalation and ingestion.

- **Polycyclic Organic Matter** (POM)—Defines a broad class of compounds that includes the polycyclic aromatic hydrocarbon compounds (PAH), of which benzo(a)pyrene is a member. Cancer is the major concern from exposure to POM. EPA has classified seven PAHs (benzo[*a*]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) as probable human carcinogens.

While the FHWA considers these nine compounds to be the priority MSATs, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule described above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOVES2014a model (FHWA 2016), even if vehicle activity (vehicle miles traveled [VMT]) increases by 45 percent as assumed from 2010 to 2050, a combined reduction of 91 percent in the total annual emission rate for the priority MSATs is projected for that same period (Exhibit 1).

Exhibit 1: National MSAT Emission Trends 2010–2050 for Vehicles Operating on Roadways Using EPA's MOVES2014a Model



Source: FHWA 2016

Air Analysis Methodology

Regional Analysis

Criteria Pollutants

A regional (or mesoscale) analysis determines a project's overall impact on regional air quality. A transportation project is usually analyzed as part of a regional transportation network developed by the county or state. It is now common for WSDOT projects in the Puget Sound Region to rely on the PSRC regional model. A project-level regional analysis was conducted to estimate the SR 167 Completion Project's impact on regional air quality levels in King and Pierce Counties. This analysis is based on all roadways in the PSRC regional model and estimates daily "pollutant burden" levels with and without the Puget Sound Gateway Program. The project's regional study area is shown on Exhibit 2. The 2006 Tier II FEIS analysis qualitatively discussed regional effects. WSDOT policy at that time did not require regional emissions to be quantified as part of that analysis.

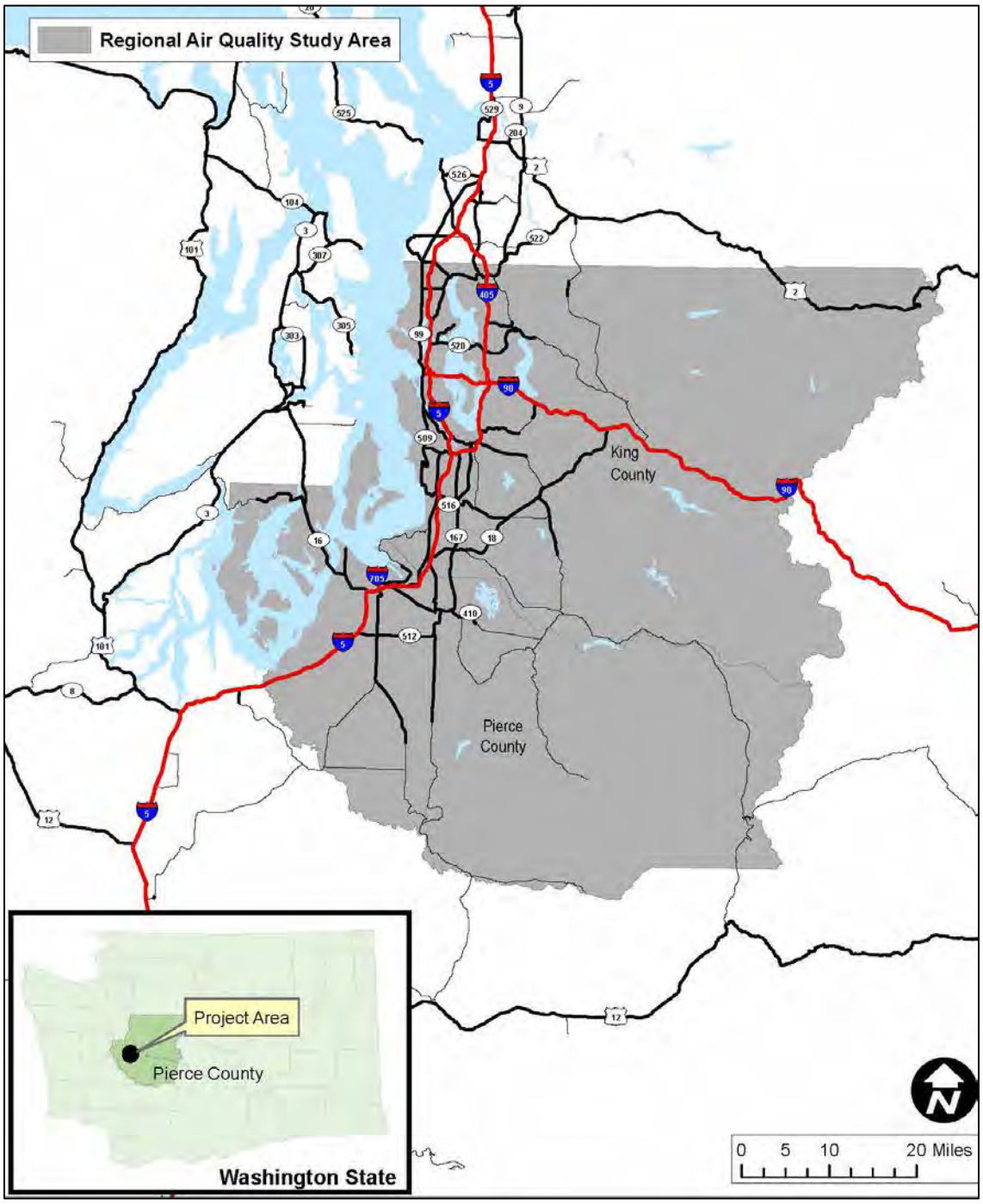
Mobile Source Air Toxics

FHWA's *Updated Interim Guidance on Mobile Sourced Air Toxic Analysis in NEPA Documents* (FHWA, 2016) groups projects into the following categories:

- Exempt Projects and Projects with no Meaningful Potential MSAT Effects
- Projects with Low Potential MSAT Effects
- Projects with Higher Potential MSAT Effects

FHWA's Interim Guidance provides examples of "Projects with Low Potential MSAT Effects." These projects include minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic projections are less than 140,000 to 150,000 annual average daily traffic (AADT). Pursuant to the new regional travel demand model network that was developed for this (2017) air quality analysis, the SR 167 Completion Project would have less than 140,000 AADT; therefore, it would qualify as a project with low potential MSAT effects. For these projects, a qualitative assessment of emissions projections is recommended; however, because a regional analysis for criteria pollutants is being completed, WSDOT decided to complete a quantitative regional MSAT analysis as well. Again, a qualitative analysis was completed for the 2006 Tier II FEIS analysis as no regional emissions were quantified at the time.

Exhibit 2: Regional Air Quality Study Area



Regional Modeling

For WSDOT projects, EPA's MOVES model is used to estimate regional emission factors. In the Puget Sound Region, PSRC provides area-specific parameters when available. MOVES2014a is the latest version of the MOVES program and the version used for this analysis. Area-specific parameters, as provided by PSRC, were used. If data were not available, default county-level information was used. Table 3 shows the default county-level parameters used and those provided by PSRC.

Table 3: Area-Specific MOVES2014a Parameters

County	County-specific Inputs Provided by PSRC	County Default Inputs
King	Vehicle age distribution Fuel Meteorological data Inspection and maintenance area information	Advanced fuel and technology
Pierce	Vehicle age distribution Fuel Meteorological data Inspection and maintenance area information Advanced fuel and technology	None used

Traffic Data

Regional traffic data has been updated since the 2006 FEIS. Traffic data (e.g., year of analysis, traffic volumes, operating speed, link length for each section speeds and volumes, time period of the data [hours of the day], and vehicle fleet mix) were supplied by the SR 167 Completion Project's transportation team and are documented in the project's Transportation Discipline Report (WSDOT, November 2017). The operational regional emission burden analysis was completed using this updated traffic data.

Particulate Matter (PM_{10} and $PM_{2.5}$) Analysis

On March 10, 2006, EPA issued a final rule regarding the localized or "hot-spot" analysis of $PM_{2.5}$ and PM_{10} (40 CFR Part 93). This rule requires hot spot analyses only for transportation projects with significant diesel traffic in nonattainment and maintenance areas.

For the proposed SR 167 Project's Phase 1 Improvements, the project area is currently classified as a maintenance area for both PM_{10} and $PM_{2.5}$. In 2009, EPA classified the Tacoma-Pierce County area a nonattainment area because fine particle ($PM_{2.5}$) pollution levels exceeded air quality standards from 2006 to 2008. On February 10, 2015, EPA re-designated the Tacoma-Pierce County nonattainment area to attainment and approved the revision to the SIP and associated maintenance plan. Since the area is currently a maintenance area for both $PM_{2.5}$ and PM_{10}, it must be determined if the project is one of air quality concern, which case would require a quantitative hot-spot analysis.

The project has gone through the required interagency coordination process to determine if it is a "project of air quality concern." The interagency Air Quality Consultation partners consist of representatives from the EPA, FHWA, PSRC, PSCAA, FTA and Ecology. On December 19, 2017, WSDOT held a

conference call with PSRC, EPA, FHWA, and FTA to discuss the project. In March 2018, all partners (PSRC, EPA, FHWA, FTA, PSCAA, and Ecology) confirmed via email that they support the determination that this project is not one of air quality concern and no hot-spot analysis is required. PM_{10} and $PM_{2.5}$ operational effects were also not evaluated in the 2006 Tier II FEIS Air Quality Technical Report.

Analysis of Construction Effects

A qualitative analysis was conducted of potential construction effects associated with emissions from dust-generating activities, operation of heavy-duty diesel equipment, and trucking activities within major construction areas.

Conformity Compliance Determination

Areas that meet the NAAQS are deemed attainment areas. Areas not in compliance with the NAAQS are deemed nonattainment areas. Areas that were formerly classified as nonattainment areas but have since demonstrated attainment with the NAAQS are classified as maintenance areas for 20 years. The SR 167 Completion Project is located in an area that is designated as a maintenance area for $PM_{2.5}$ and PM_{10}.

In 2006, since the project area was designated as an O_3 and CO maintenance area, a conformity analysis was completed for these criteria pollutants; because the area was in attainment for all other pollutants (for $PM_{2.5}$, PM_{10}, SO_2, NO_2, and Pb), no additional conformity analyses were completed. Because the project is located in an area that is currently designated as a maintenance area for $PM_{2.5}$ and PM_{10}, the project must now demonstrate conformance with the NAAQS for $PM_{2.5}$ and PM_{10}. The region is in attainment for all of the other criteria pollutants; therefore, further conformity analysis of other criteria pollutants (CO, SO_2, NO_2, O_3, and Pb) is not required and was therefore not completed for this project.

The CAA requires states to develop a State Implementation Plan (SIP) for protecting and maintaining air quality in all areas of the state. Proposed transportation projects requiring federal funding or approval must comply with EPA's Transportation Conformity Rule at both the regional and project level. A project demonstrates regional conformity if it is included in a conforming regional transportation plan and a regional transportation improvement program. A project demonstrates project-level conformity by showing that it would not cause or contribute to any new violation of any NAAQS, increase the frequency or severity of any existing NAAQS violations, or delay timely attainment of the NAAQS.

Study Area Characteristics

The topography of the Puget Sound region is characterized by low rolling hills intermingled with a complex maze of interconnected waterways linked to the Pacific Ocean through Puget Sound. The region has a mild climate with cool summers and mild, wet, and cloudy winters. Land uses in the study area are low-density residential with some higher-density residential, commercial, and industrial uses.

Monitored Air Quality Concentrations

Air quality monitors measure pollutant concentrations throughout the country. EPA, state, tribal, and local agencies use that data to ensure that pollutants remain at levels that protect public health and the environment. Nationally, average pollutant concentrations have decreased substantially over the years.

Air quality in the Puget Sound region has followed similar trends. The evaluation of existing air quality is based on monitoring data collected. When a monitoring station records a pollutant concentration above the standards listed in Table 2, it is called an "exceedance." There have not been any exceedances of the PM_{10} standard in Tacoma since 1990. CO and PM_{10} monitoring in Pierce County ended at the two nearest monitoring stations in 2006 and 2007, respectively. Measurement of the $PM_{2.5}$ standard started in 2006 in Tacoma, and the most recent three years are shown in Table 4.

Table 4: $PM_{2.5}$ Ambient Air Quality Monitoring Data ($\mu g/m^3$)

Averaging Time	7802 South L Street, Tacoma, WA			EPA Primary NAAQS
	2014	2015	2016	
Annual	7.5	7.9	6.8	12.0
24-Hour	30	31	23	35

Source: EPA Air Quality System Data Mart (EPA 2017) http://www.epa.gov/airdata/

4. Would the Phase 1 Improvements result in any new or significant impacts?

Phase 1 Improvements would not result in any new significant impacts as compared to the 2006 FEIS Build Alternative.

Criteria Pollutants

Regional criteria pollutants were analyzed for the Existing Conditions, the No Build Alternative and the proposed SR 167 Completion Project Phase 1 Build Alternative. As shown in Table 5, both the No Build Alternative and the SR 167 Phase 1 Build Alternative are expected to increase average daily VMT and decrease regional pollutant emissions by 10 to 87% percent, as compared to the Existing Conditions. The Build Alternative is expected to increase average daily VMT by 1 percent and increase regional pollutant emissions by 1.0 to 14 percent, as compared to the No Build Alternative. Although the regional emissions due to the Build Alternative are greater than emissions from the No Build Alternative, there is a substantial decrease from existing conditions, and concentrations of criteria pollutants would continue to be below the NAAQS. As such, the SR 167 Phase 1 Improvements are predicted to have no meaningful effect on regional pollutant burden levels.

Table 5: Regional Criteria Pollutant Emission Assessment

Alternative	Average Yearly Vehicle Miles Traveled	Pollutant (tons per year)				
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Existing Conditions	18,470,785,650	86,321	19,922	1,571	701	165
2045 No Build	22,334,511,000	27,830	2,609	1,238	247	118
Percent change—No Build compared to Existing Conditions	21%	-68%	-87%	-21%	-65%	-29%
2045 Build	22,453,605,000	28,328	2,644	1,407	270	123
Percent change—Build compared to Existing Conditions	22%	-67%	-87%	-10%	-61%	-25%
Percent change—Build compared to No Build	1%	2%	1%	14%	10%	4%

As a result of improved traffic operations and lower delays at localized intersections compared to the No Build Alternative (Table 6), the Phase 1 Improvements would result in relatively small reductions in pollutant emissions as compared to the No Build Alternative at these intersections. Because of the decrease in delays, emissions levels for CO, $PM_{2.5,}$ and NO_x would be expected to remain below the NAAQS and there would be no direct effect. These small reductions in pollutant emissions would be a benefit.

Table 6: Signalized Intersections Levels of Service

Number of intersections analyzed:			
Intersections	Existing 2015	No Build 2045	Phase 1 Improvements 2045
Total Signalized Intersections	27	29	36
AM Peak Hour			
AM Peak hour LOS C or above	21	14	27
AM Peak hour LOS D or below	6	15	9
PM Peak Hour			
PM Peak hour LOS C or above	17	14	27
PM Peak hour LOS D or below	10	15	9

Note: One of the signalized intersections change from C or better to LOS D, E, or F due to the project under the PM peak hour.

MSAT Analysis

A regional MSAT analysis was conducted for Existing Conditions, the No Build Alternative and the SR 167 Phase 1 Build Alternative. As shown in Table 7, the 2007 EPA rule described above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Although Existing average yearly VMT is predicted to increase by over 20 percent, No Build and Build MSAT emissions are predicted to decrease by 54 to 99 percent. Compared to the No Build Alternative, the Build Alternative is expected to increase average daily VMT by 1 percent, and MSAT emissions would increase by 0 to 15%. Although the MSAT emissions due to the Build Alternative are greater than the No Build Alternative, the magnitude of reductions from cleaner engines and fuels is so great that MSAT emissions in the study area are lower in the future for both alternatives. As such, the Build Alternative is predicted to have no meaningful effect on regional pollutant burden levels.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view (FHWA 2016*)*, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSATs. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). HEI is a nonprofit corporation chartered in 1980 as an independent research organization to provide high-quality, impartial, and relevant science on the health effects of air pollution. HEI typically receives balanced funding from the U.S. Environmental Protection Agency and the worldwide motor vehicle industry. Other public and private organizations periodically support special projects or certain research programs. Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) or in the future as vehicle emissions substantially decrease.

Table 7: Regional MSAT Emission Assessment

Alternative	Average Yearly Vehicle Miles Traveled	Pollutant (tons per year)								
		1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	POM
Existing Conditions	18,470,785,650	11	55	6	121	631	79	95	12	5
2045 No Build	22,334,511,000	0.05	9	1	32	228	35	23	2	1
Percent change No Build compared to Existing	21%	-99.95%	-84%	-83%	-74%	-64%	-56%	-75%	-81%	-86%
2045 Build	22,453,605,000	0.05	10	1	34	263	36	25	2	1
Percent change Build compared to Existing Conditions	22%	-99.95%	-83%	-83%	-72%	-58%	-54%	-74%	-81%	-86%
Percent change Build compared to No Build	1%	0%	7%	0%	5%	15%	3%	7%	7%	4%

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts. Each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) health and welfare for MSAT compounds and, in particular, for diesel PM. EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal)."

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf).

Because of the limitations in the methodologies for forecasting the health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers who would need to weigh this information against project

benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Particulate Matter (PM_{10} and $PM_{2.5}$) Analysis

WSDOT's SR 167 Completion Project has gone through the required interagency coordination process to determine that it is not a project of air quality concern. All agencies responded in March 2018, via email, that they concur that this project is not considered a project of air quality concern as defined by the PM Hot Spot Guidance (Attachment C) and that a PM hot-spot analysis is not required.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

The 2006 Tier II FEIS mitigation measures during operation are still valid as compared to the 2006 FEIS Build Alternative.

As detailed above, no meaningful impact on regional criteria pollutant or MSAT levels is predicted, and because no exceedances of the NAAQS are predicted, no design or operational mitigation measures are required. The 2006 Tier II FEIS Air Quality Analysis also proposed no specific mitigation for operational conditions of the 2006 Build Alternative.

The current findings and recommended mitigation are consistent with the 2006 Tier II FEIS Air Quality Analysis. The SR 167 Completion Project's new proposed Phase 1 Improvements would not result in a significant environmental impact regarding operational air quality, and no mitigation is proposed.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

Phase 1 Improvements would not result in any new temporary construction effects as compared to the 2006 FEIS Build Alternative.

Air quality impacts during construction of the SR 167 Completion Project Phase 1 Improvements could occur as a result of emissions generated from construction equipment, construction activities, and vehicles experiencing congestion because of construction detours or delays.

Construction-related air quality effects result primarily from emissions of heavy-duty construction equipment (e.g., bulldozers, backhoes, and cranes), diesel-fueled mobile sources (e.g., trucks, brooms, and sweepers), diesel- and gasoline-fueled generators, and on-site and off-site project-related vehicles (e.g., service trucks and pickups).

In addition dust, or fugitive PM, is also of concern. PM_{10} emissions are associated with land clearing, ground excavation, grading, cut-and-fill operations, and structure erection. These emissions would vary from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive PM_{10} emissions from construction activities could be noticeable if uncontrolled. Mud and particulates

from trucks could also be of concern if construction trucks are routed through streets near sensitive land uses (e.g., residences, schools, and parks).

Construction traffic and lane closures increase congestion and reduce the speed of other vehicles, which could temporarily increase emissions burdens. These effects would be temporary, and generally limited to the immediate area in which the congestion occurs.

In addition to potential air quality impacts, some construction work activities (particularly those involving paving operations using asphalt) could result in short-term odors, which could be detectable to some people near the site and would be diluted as distance from the site increases. The above temporary construction impacts to air quality are similar to what was documented in the 2006 FEIS.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The 2006 Tier II FEIS mitigation measures during construction are still valid as compared to the 2006 FEIS Build Alternative.

Particulate emissions (in the form of fugitive dust during construction activities) are regulated by PSCAA. The operator of a source of fugitive dust is required to take reasonable precautions to prevent fugitive dust from becoming airborne and must maintain and operate the source to minimize emissions (AGCW 1997). Construction impacts from the SR 167 Completion Project's proposed Phase 1 Improvements will be minimized by incorporating mitigation measures per the WSDOT standard specifications into the construction specifications for the project. A Fugitive Dust Control Plan will be required to be prepared by the contractor prior to construction to comply with PSCAA regulations. This plan will include mitigation measures to control PM_{10}, deposition of particulate matter, and emissions of CO and ozone precursors, as well as MSATs during construction. Specific mitigation measures will include the following, as applicable:

- Spraying exposed soil with water or other dust palliatives
- Covering all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck)
- Removing particulate matter deposited on paved, public roads
- Minimizing delays to traffic during peak travel times
- Placing quarry spall aprons where trucks enter public roads
- Graveling or paving haul roads
- Planting of vegetative cover as soon as possible after grading
- Minimizing unnecessary idling of on-site diesel construction equipment
- Locating diesel engines, motors, or equipment as far away as possible from existing residential areas
- Locating staging areas away from school buildings and playgrounds

- Using efficient street sweeping equipment at site access points and all adjacent streets used by haul trucks
- Minimizing hours of operation near sensitive receptor areas and rerouting the diesel truck traffic away from sensitive receptor areas
- Coordinating construction activities with the Puyallup Recreation Center and all other sensitive receptor locations
- Educating vehicle operators to shut off equipment when not in active use to reduce idling
- Developing streamlined staging/work zone areas to minimize construction equipment back-ups and idling
- Using cleaner fuels as appropriate

The 2006 Tier II FEIS proposed similar construction mitigation measures for air quality, and most were defined as project environmental commitments in the 2007 ROD. The above construction mitigation measures and environmental commitments made in the ROD remain applicable to the SR 167 Phase 1 Improvements.

8. Conclusion

With adherence to the regulatory requirements described above, no new significant impacts to air quality that were not previously identified in the 2006 FEIS, from either construction or operations, would occur because of the Phase 1 Improvements.

Regulatory Compliance Finding

FHWA and WSDOT projects must comply with the project-level conformity criteria of the EPA Conformity Rule and the applicable State regulations, WAC Chapter 173-420. Regionally significant projects must be included in a conforming Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP) by the regional metropolitan planning organization. The SR 167 Completion Project—Puyallup to SR 509 is included in the latest version of the PSRC's MTP and TIP. As stated in 40 CFR Part 93, the following criteria must be met when determining project conformity. A brief summary of the project's conformity to the state SIP is discussed with each criterion (criteria are indicated by italics).

- *The conformity determination must be based on the latest planning assumptions.* PSRC's conformity determination uses the latest planning assumptions.
- *The project must come from a conforming transportation plan and program.* Stage 1 (I-5 to SR 509) is included in the TIP under ID WDO-449, and Stage 2 (I-5 to SR 161) is included in the TIP under ID WDO-410. The project scope is included in PSRC's MTP as ID 1659 and ID 1722. The project descriptions in these MTP references have been updated as part of the Draft Transportation 2040 Update (found at https://www.psrc.org/sites/default/files/t2040_report.pdf) to reflect the latest project description (PSRC 2017).

- *There must be a current conforming plan and a current conforming TIP at the time of project approval.* There is a current conforming MTP and TIP. An amendment to T2040 was adopted on June 25, 2015 (PSRC 2015). The current TIP was adopted in October 2016 (PSRC 2016).
- *The FHWA project must not cause or contribute to any new localized exceedance or violation in CO and PM_{10}, $PM_{2.5}$ nonattainment or maintenance areas.* The project is not located in an area designated nonattainment or maintenance for CO; therefore, no further CO analysis is required. The project is located in an area that is designated as a maintenance area for $PM_{2.5}$ and PM_{10}. As described earlier in this report, for PM_{10} and $PM_{2.5}$ this project is not considered a project of air quality concern, and no additional PM_{10} or $PM_{2.5}$ analysis is required.

Conformity Finding—The project must be included in PSRC's MTP and TIP. The SR 167 Completion Project currently meets all of the conformity criteria of 40 CFR Part 93 and WAC Chapter 173-420 and conforms to the SIP.

References

Associated General Contractors of Washington (AGCW), 1997. *Guide to Handling Fugitive Dust from Construction Projects.* Seattle, Washington.

Federal Highway Administration (FHWA). 2016. *Updated Interim Guidance on Air Toxic Analysis in NEPA Documents,* October 2016. https://www.fhwa.dot.gov/environMent/air_quality/air_toxics/policy_and_guidance/msat/

Puget Sound Regional Council (PSRC). October 2016. *2017-2020 Transportation Improvement Program*. https://www.psrc.org/2017-2020-tip-documentation

Puget Sound Regional Council (PSRC). June 2015. *Transportation 2040*. https://www.psrc.org/our-work/transportation-2040

Puget Sound Regional Council (PSRC). July 2017. *Regional Capacity Projects List*. https://www.psrc.org/our-work/regional-planning/rtp/regional-capacity-projects-list-and-approval-process

U.S. Environmental Protection Agency (EPA). *MOVES2014a Motor Vehicle Emission Simulator,* 2015. https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves

U.S. Environmental Protection Agency (EPA). *Particulate Matter, Basic Information,* 2015. https://www.epa.gov/pm-pollution

U.S. Environmental Protection Agency (EPA). *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas,* 2015. http://www3.epa.gov/otaq/stateresources/transconf/documents/420b15084.pdf

U.S. Environmental Protection Agency (EPA). *Air Quality System Data Mart. 2017.* http://www.epa.gov/airdata/

Washington State Department of Transportation (WSDOT), September 2001. SR 167: State Route 509 to Puyallup. Air Quality Technical Report.

Washington State Department of Transportation (WSDOT), November 2006. SR 167Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation. http://www.wsdot.wa.gov/Projects/SR167/completion/Publications.htm

Washington State Department of Transportation (WSDOT), March 2013. *Air Quality Analysis – Reviewer Checklist.* http://www.wsdot.wa.gov/NR/rdonlyres/03453B72-D66B-4EDA-A741-C26955C7C0CD/0/AirQualityCklist.pdf

Washington State Department of Transportation (WSDOT), June 20017. *Environmental Manual. https://www.wsdot.wa.gov/publications/manuals/fulltext/M31-11/em.pdf*

Washington State Department of Transportation (WSDOT), November 2017. *Transportation Discipline Report.*

1

Attachment A



Attachment B



Attachment C—Particulate Matter Project of Air Quality Concern

PARTICULATE MATTER
PROJECT OF AIR QUALITY CONCERN

Last updated April 9, 2018

Purpose of this form

A hot-spot analysis is an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant NAAQS. A hot-spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested highways or transit terminals. A PM hot-spot analysis includes emissions modeling and dispersion modeling that is consistent with the recommendations for air quality modeling in EPA's "Guideline on Air Quality Models" (Appendix W to 40 CFR Part 51).

Transportation projects located in areas designated nonattainment or maintenance for PM_{10} or $PM_{2.5}$ may be required to demonstrate project-level conformity. Projects must complete a PM hot-spot analysis if they are considered a project of air quality concern, as defined by Section 93.123(b)(1) of the conformity rule.

The rule provides the criteria, but it does not provide thresholds to define the criteria further. Interagency consultation is encouraged to determine whether individual projects are considered to be of local air quality concern. This form should be used by project sponsors to summarize the project details and provide details to justify that a project is not of air quality concern and that a PM hot-spot analysis is not required.

Directions for using this form

Project sponsors should answer each question in the table below. In many cases, a simple yes or no is sufficient, or just a number will answer the question. For questions requiring an explanation, provide as many quantitative details as possible. If you would like to provide attached information, summarize it in the table, and reference the attachment.

PSRC will address the final recommendation at the end of the form, reflecting input from the air quality consultation partners.

Project Details	
Project Name	**Puget Sound Gateway Program - Phase 1 of the SR 167 Completion Project (WSDOT PIN: 316706T, STIP-ID: SDO-410)**
Project Sponsor	WSDOT
Brief Project Description	The SR 167 Completion Project will build the remaining four miles of the SR 167 freeway, a new, 4-lane facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue undercrossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is planned (based on Legislative intent) to be a fully tolled facility.
Attainment Status	
Project Limits	SR 161 to SR 509
Is the project located in a nonattainment or maintenance area for PM_{10} or $PM_{2.5}$?	Yes. Pierce County PM_{10} and $PM_{2.5}$ maintenance areas. Monitored PM_{10} levels were well below the National Ambient Air Quality Standards for several years, and monitoring was discontinued in 2007. The primary source of $PM_{2.5}$ in this area is wood smoke from home heating devices.

1

Criteria of projects requiring a PM hot spot analysis as defined by 40 CFR 93.123(b)(1)						
(i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles						
	Segment	***Alternative***	***AADT***	***Diesel Heavy Truck Volume***	***Diesel Medium Truck Volume[1]***	***Total Diesel Truck Volume***
What are traffic and diesel truck volumes for the proposed project? *(Traffic Data developed as part of WSDOT's Phase 1 of the SR 167 Completion Project Traffic Analysis completed in 2017)*	I-5 (North of 54th)	Existing (2015)	202,500	10,520 (5%)	4,550 (2%)	15,070 (7%)
	I-5 (South of 54th)	Existing (2015)	200,600	8,550 (4%)	4,242 (2%)	12,792 (6%)
	I-5 (North of 54th)	2045 No Build	235,700	11,980 (5%)	5,320 (2%)	17,300 (7%)
	I-5 (South of 54th)	2045 No Build	242,600	10,220 (4%)	5,180 (2%)	15,400 (6%)
	I-5 (North of 167)	2045 Build	241,000	12,090 (5%)	5,936 (2%)	18,026 (7%)
	I-5 (South of 167 and North of 54th)	2045 Build	213,400	8,450 (4%)	4,396 (2%)	12,846 (6%)
	I-5 (South of 54th)	2045 Build	237,700	8,180 (3%)	4,858 (2%)	13,038 (5%)
	SR 167	Existing and No Build	This portion of SR 167 does not exist under existing and No Build			
	SR 167 (South of I-5)	2045 Build	61,400	1,940 (3%)	2,814 (5%)	4,754 (8%)
	SR 167 (North of I-5)	2045 Build	39,700	5,960 (15%)	2,541 (6%)	8,501 (21%)

2

[1] To determine the number of medium duty diesel trucks, the national average of 70% of medium duty trucks using diesel was applied to medium duty traffic data.

<table>
<tr><th colspan="5">Criteria of projects requiring a PM hot spot analysis as defined by 40 CFR 93.123(b)(1) (continued)</th></tr>
<tr><td colspan="5">(i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles</td></tr>
<tr><td>Does the project include greater than 125,000 AADT and 10,000 diesel truck traffic? (see note below table)</td><td colspan="4">The most heavily traveled section of the new SR 167 roadway would have about 60,000 AADT and about 8,500 diesel trucks.

I-5 would continue to have greater than 125,000 AADT and greater than 10,000 diesel trucks daily. Changes in total diesel truck volumes on I-5 between Build and No Build conditions would be:
North of SR 167 interchange: 4% increase. This increase in AADT would cause an insignificant increase in PM emissions as vehicles continue to get cleaner in the coming years. The emissions burden analysis for this project shows total project emissions decreasing from existing conditions under both Build and No Build Alternatives in 2045.
SR 167 to 54th: 25% decrease
South of 54th interchange: 15% decrease
The combined interchange changes will result in an overall reduction in both AADT and PM emissions on I-5.</td></tr>
<tr><td>If yes, explain why this project should not be considered a project of air quality concern.</td><td colspan="4">Not applicable.</td></tr>
<tr><td colspan="5">(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project</td></tr>
<tr><td rowspan="3">How many intersections are affected by the project?</td><td colspan="4">Number of intersections analyzed:</td></tr>
<tr><td></td><td>Existing 2015</td><td>No Build 2045</td><td>Build 2045</td></tr>
<tr><td>Intersections Evaluated</td><td>27</td><td>29</td><td>36</td></tr>
<tr><td rowspan="4">How many intersections change to a Level of Service (LOS) D, E, or F due to project?</td><td colspan="4">One of the signalized intersections change from C or better to LOS D, E, or F due to the project.</td></tr>
<tr><td></td><td>Existing 2015 AM/PM</td><td>No Build 2045 AM/PM</td><td>Build 2015 AM/PM</td></tr>
<tr><td>LOS C or above</td><td>21/17</td><td>14/14</td><td>27/27</td></tr>
<tr><td>LOS D or below</td><td>6/10</td><td>15/15</td><td>9/9</td></tr>
<tr><td>If intersection is changing to LOS D, E, or F, explain reason for increased traffic and how much of this increase is due to diesel vehicles.</td><td colspan="4">In 2045, one intersection (Alexander Ave E & NB SR 509) under the PM peak hour in the project area would degrade to an LOS of D or lower as a result of the project. No intersection would degrade to an LOS of D or lower under the AM peak hour. The total traffic at this intersection would not result in a substantial increase of diesel vehicles, see (ii) additional Intersection Information below for more information on these intersections.</td></tr>
<tr><td colspan="5">(ii) Additional Intersection Information:</td></tr>
<tr><td colspan="5">WSDOT participated in a Scoping Study to Identify Potential Project Types and Situations That Will Not Create PM Hot Spots, prepared by Sonoma Technology, Inc, in 2015. As demonstrated in Figure 3 of the study, based on the MOVES2014 emissions model, by the year 2035, an Annual Average Daily Traffic (AADT) of approximately 500,000 vehicles would be required to reach emissions equivalent 125,000 vehicles in 2006.

The volumes of the intersection that would degrade to an LOS of D or lower as a result of the project as listed in the Table below.</td></tr>
<tr><td>Intersection</td><td colspan="4">PM Peak Hour Entering Intersection Total Vehicle Volume</td></tr>
<tr><td rowspan="2">Alexander Ave E & NB SR 509</td><td>Existing 2015</td><td>No Build 2045</td><td colspan="2">Build 2045</td></tr>
<tr><td>2,320</td><td>2,090</td><td colspan="2">2,645</td></tr>
</table>

1

Criteria of projects requiring a PM hot spot analysis as defined by 40 CFR 93.123(b)(1) (continued)	
(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location	
Does this project include a new bus or rail terminal, transfer point, or another feature that includes a significant number of diesel vehicles congregating at a single location?	No.
(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location	
Does this project include the expansion of an existing bus or rail terminal, transfer point, or another feature that includes a significant number of diesel vehicles congregating at a single location?	No.
(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM2.5 or PM10 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation	
In the PSRC region, the SIP does not identify any specific projects or intersections as sites of possible violation of the PM_{10} or $PM_{2.5}$ NAAQS.	
Provide the source or sources used to supply the data in this form.	
The traffic data provided in this form was taken from the data developed for the Puget Sound Gateway Program - Phase 1 of the SR 167 Completion Project and has been fully documented in the transportation section of the project's environmental documentation.	
If there are any other considerations you would like to mention, please address them in the space below.	

Note: The conformity rules do not define a threshold for what should be considered a significant amount of diesel traffic. Appendix B of EPA's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* includes examples of projects of air quality concern. The first example listed is "A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic." In 2013, WSDOT chose to use these values as a guideline to determine projects of air quality concern. Since there is no threshold listed in the conformity rule, interagency consultation can be used to determine if a project is of air quality concern.

Recommendation from Air Quality Consultation Partners

On December 19, 2017, WSDOT held a conference call with PSRC, EPA, FHWA, and FTA to discuss the project. In March 2018, all partners (PSRC, EPA, FHWA, FTA, PSCAA, and Ecology) confirmed via email that they support the determination that this project is not one of air quality concern and no hot-spot analysis is required.

Noise

COPY TO:	**Project File**
PREPARED BY:	**Ginette Lalonde, Lead Noise Analyst, WSP USA**
DATE:	**August 28, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the Washington State Department of Transportation (WSDOT) Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to noise.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps)), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build Phase 1
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two park and ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Type 1 Trigger for Noise Analysis

A traffic noise analysis is required by law (23 CFR 772) for federally funded projects and required by state policy (WSDOT 2012) for other funded projects that meet one or more of the following criteria:

- Involve construction of a new highway
- Significantly change the horizontal or vertical alignment
- Increase the number of through traffic lanes on an existing highway
- Alter terrain to create new line-of-sight to traffic for noise sensitive receivers

The Type 1 Trigger for this project is the construction of a new highway. Therefore, a traffic noise analysis is required for the project. A summary of the noise analysis and abatement process is included in Appendix A.

Noise Relevant Project Information

The following is a list of items relevant to the traffic noise analysis for the existing, new No-Build, and new Build condition of the proposed SR 167 Phase 1 Improvements:

- The project includes the addition of a new freeway
- The project includes new accesses to and from the new proposed SR 167 and connecting routes
- Noise-sensitive land uses are located west of I-5 and southeast of SR 161
- The project would maintain travel speeds between 35 and 55 miles per hour (posted), depending on location along the new proposed Phase 1 alignment.
- Year for Existing (2015) and Build/No-Build conditions (2045)

3. What has changed in the affected environment since 2006?

The affected environment relative to noise as described in Section 3.6.2 of the 2006 FEIS generally remain applicable to the proposed Phase 1 Improvements. This section details what aspects have changed since 2006.

WSDOT's affected environment documentation requirements for traffic noise analysis include:

- Characteristics of sound and noise
- Traffic noise analysis methodology
- Traffic noise levels
- Traffic noise abatement

Changes to the affected environment documentation requirements, and changes to the physical environment relative to noise, are described below.

Characteristics of Sound and Noise

The Characteristics of Sound and Noise described in the "Noise Technical Report" (February 2004) referenced in the 2006 FEIS remains applicable to the proposed SR 167 Project's Phase 1 improvements. However, noise regulations and impact criteria have changed since 2006.

Changes in Noise Regulations and Impact Criteria

The FHWA Noise Abatement Criteria (NAC) (23 CFR 772) are based on speech interference, which is a well-documented effect that is relatively reproducible in human response studies. The traffic noise impacts are quantified using the equivalent sound level (L_{eq}). The L_{eq} is a measure of the average noise level during a specified period of time. A 1-hour period, or hourly L_{eq} [$L_{eq}(h)$], is used to measure highway noise. L_{eq} is a measure of total noise during a time period that places more emphasis on occasional high

noise levels that accompany general background noise levels. For example, if there are two different sounds, and one contains twice as much energy but lasts only half as long as the other, the two would have the same L_{eq} noise levels.

Traffic noise impacts occur when predicted $L_{eq}(h)$ noise levels approach or exceed the NAC established by FHWA, or substantially exceed existing noise levels (FHWA 2010). WSDOT considers a noise impact to occur if predicted $L_{eq}(h)$ noise levels approach within 1 dBA of the NAC. Since the 2006 FEIS, the FHWA NAC has been updated. See Exhibit 1 for the specified exterior $L_{eq}(h)$ noise levels for various land activity categories. WSDOT also considers an increase of 10 dBA or more to be a substantial increase and a traffic noise impact.

Exhibit 1: FHWA Noise Abatement Criteria by Land Use

Activity Category	NAC $L_{eq}(h)$ at Evaluation Location (dBA)	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential (single and multi-family units)
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. Includes undeveloped land permitted for these activities.
F	—	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	—	Undeveloped lands that are not permitted

Since the 2006 Tier II FEIS Noise Analysis, WSDOT's Noise Policy and Procedures were updated. The 2011 WSDOT Noise Policy and Procedures have new noise barrier feasibility and reasonableness requirements. For a noise barrier to be feasible it now has to achieve a noise reduction of at least 5 dBA, whereas in the 2006 Tier II FEIS analysis it had to achieve a 7 dBA reduction. The 2011 determination of reasonableness evaluates the cost effectiveness of a barrier and includes the number of sensitive receptors benefited by at least 5 dBA reduction, whereas the 2006 Tier II FEIS analysis included receptors benefited by at least 3 dBA. The 2011 determination for noise barrier reasonableness also includes at least a 7 dBA noise reduction for one or more receivers.

Traffic Noise Analysis Methodology

The traffic noise analysis methodology described in the Noise Technical Report (February 2004) supporting the 2006 FEIS remains applicable to the SR 167 Project's new proposed Phase 1 Improvements. However, the traffic noise study area, traffic noise measurement, and traffic noise model validation have been updated since 2006, as explained below.

Traffic Noise Study Area

The noise study area must be large enough to include all receptors between the project limits that may experience traffic noise impacts (WSDOT 2012). The physical environment of the traffic noise study area has changed since the 2006 FEIS. The study area has been updated to reflect changes in the SR 167 alignment since the 2006 FEIS and includes modeled receivers located beyond the distance where impacts can be modeled to verify that the full impacted area is captured. The new proposed Phase 1 Improvements project area is located mostly within dedicated WSDOT ROW, which passes residential, commercial, and light industrial land uses from existing SR 509 near the Port of Tacoma to I-5 and mostly undeveloped land and agricultural land with limited areas of residential and commercial land uses from I-5 to SR 161 (Meridian) in Puyallup. Surrounding land use includes agricultural land, recreational land, and areas of commercial businesses, warehousing, and residences.

Building permits from Pierce County, and the cities of Tacoma, Fife, Edgewood, Milton, and Puyallup were reviewed online in October 2017 to identify residences, commercial uses, or other WSDOT and FHWA noise-regulated land uses NAC Activity Categories B, C, D, E, or F at the properties along the SR 167 Phase 1 noise study area. The review identified that several proposed future developments near the project are currently in the permitting process in their respective jurisdictions. The developments are mostly commercial businesses and warehouse facilities with a limited number of developments that include residential use. The single-family development called the "Westridge Community," is a 360 single-family home development currently under construction located east of Freeman Road and south of 25th Street East in the City of Edgewood. The "Mortenson Farm Park" is also permitted with the City of Edgewood at Freeman Road south of 25th Street East. This park is an undeveloped city facility, a passive park, with a conceptual trail plan. A small trail project on this site is included in the City of Edgewood's Parks and Recreation Capital improvement Plan 2015-2020. Both the Westridge Community and Mortenson Farm Park developments are located approximately 500 feet from the SR 167 alignment. Both developments, in addition to existing land uses, were included for consideration in the noise analysis.

Traffic Noise Measurement

The traffic noise measurements have been updated for the SR 167 Project's proposed Phase 1 Improvements. Ambient noise levels were measured in 2015 to identify major noise sources in the project area and to establish existing peak-hour noise levels because the most of the project is a new freeway where existing traffic noise levels are consistently low due to the distance to the nearest roadway. The 2015 noise measurements are valid to support this NEPA Re-Evaluation.

Fifteen-minute measurements were conducted at 14 locations (R1 to R14) and 24-hour measurements were conducted at four of the 14 locations (R2, R3, R4, and R9). The measurement sites were chosen because they are representative of all sound level environments within the study area. Fifteen-minute

measurements were collected during free-flowing traffic conditions where traffic noise was discernible. FHWA allows 15-minute L_{eq} measurements to represent the $L_{eq}(h)$. These traffic noise measurements are not a representation of "average" existing noise levels.

Twenty-four hour noise levels were monitored at Sites R2, R3, R4, and R9 to determine the highest existing hourly noise levels at residences where existing traffic noise levels are consistently low due to the distance to the nearest roadway. Existing noise levels at these sites were estimated by comparing hourly sound levels with short-term noise levels measured nearby. As is often the case, hourly data contained some near-field peak events, such as barking dogs and emergency vehicle sirens. These peak events cause elevated hourly results and are not part of the normal noise environment. Thus, the highest hourly average sound level data was not always used for existing peak-hour conditions. Appendix E includes recorded sound level data for each 15-minute measurement and hourly sound level data for 24-hour measurements. As shown in Exhibit 2, the loudest hourly noise levels at the 14 measurement sites ranged from 40 dBA L_{eq} to 70 dBA L_{eq}, depending on the proximity to I-5, SR 509, SR 167, and local roads in the area.

Measurements were conducted on July 14, 21, and 22, 2015, September 2 and 3, 2015, and November 10, 2015, with calibrated Larson Davis Model 720 (Type 2) and 820 (Type 1) noise meters, which comply with ANSI S1.4 for instrument accuracy. All sound level monitoring equipment was calibrated before and after each measurement; the noise meters are calibrated annually by the manufacturer, Larson Davis.

Traffic counts and meteorological conditions were also recorded during field measurements for model validation. All noise measurements were performed during satisfactory weather conditions for performing noise measurements. Noise measurement data and observed traffic and meteorological conditions during measurements are provided in the field data sheets in Appendix E.

Traffic Noise Model Validation

The measurement data is summarized in Exhibit 2 with each of the 14 noise measurement sites. The traffic noise model validation described in the Noise Technical Report (February 2004) remains applicable to the Phase 1 improvements. FHWA's Traffic Noise Model (TNM) Version 2.5 (FHWA, 2004) was used for validation and to predict future $L_{eq}(h)$ traffic noise levels. TNM Version 2.5 is the most current version of the noise model.

Ten of the fourteen noise measurement sites were dominated by traffic noise, making them useful for model validation. Exhibit 2 describes the existing validation measurements (R1, R5, R6, R7, R8, and R10-R14) and the comparison of measured to model values for areas where existing traffic noise levels allow for model validation. Traffic volumes, vehicle mix, and speed data collected during each validation measurement are included in Appendix E. The validation measurements were found to model within ±2 dBA of the measured levels. Because a 2- to 3-dBA change in noise levels is barely perceptible to the average human ear, a delta of ±2 dBA is considered acceptable for noise model validation purposes.

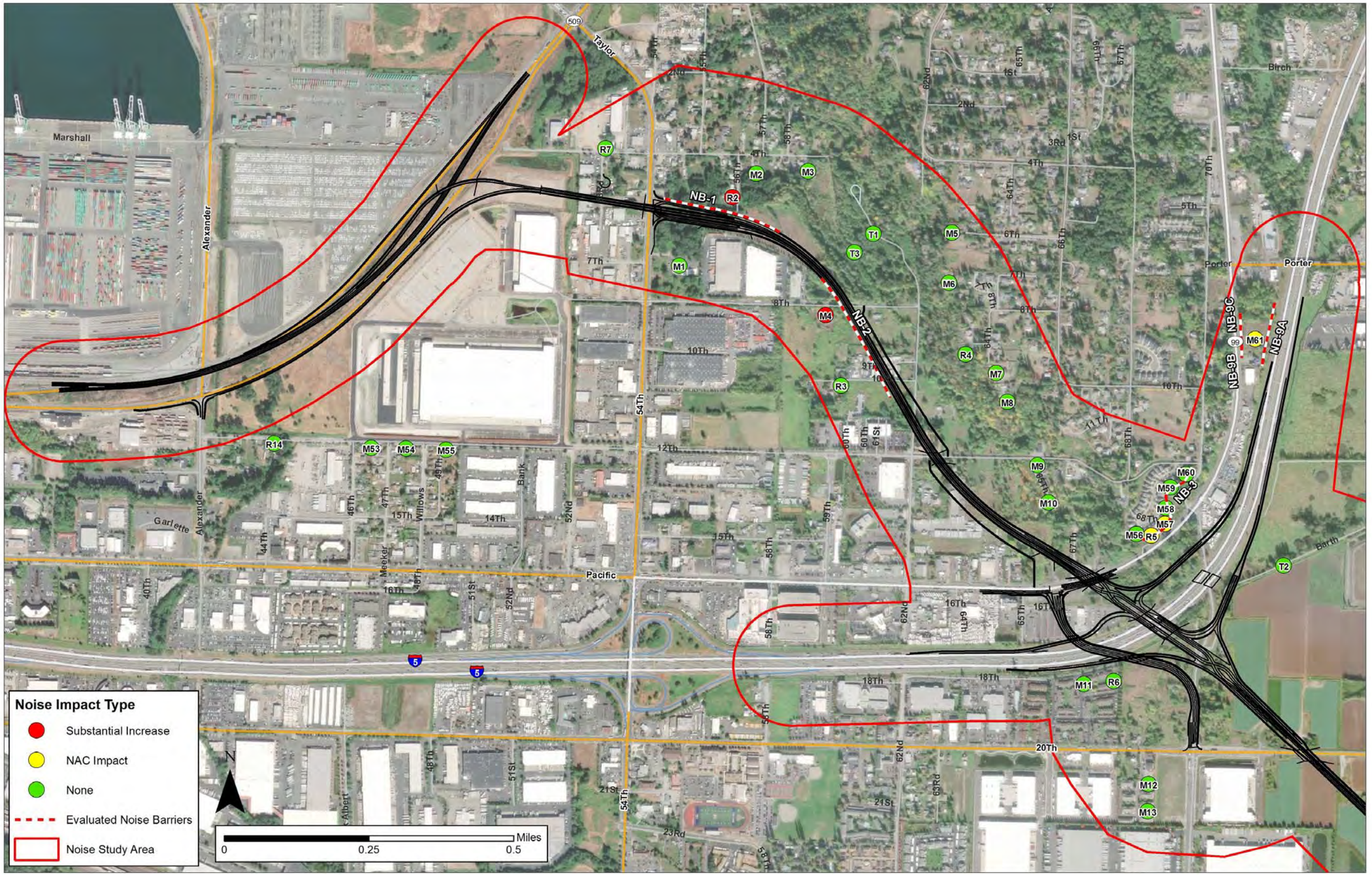
Exhibit 2: Existing Noise Measurement Data and Noise Model Validation Results

Site #/Location	Date	Start Time	Measured L_{eq} (dBA)	Modeled L_{eq} (dBA)	Difference (dBA)
R1 – Puyallup Recreation Center	7/14/15	12:39	40.1	40.4	0.3
R2 – Residence at 502 56th Ave E	7/21/15	11:45	49.0	N/A	N/A
R3 – Residence at 5923 10th St	7/21/15	13:10	53.0	N/A	N/A
R4 – Residence at 6320 9th St E	7/21/15	14:40	60.0	N/A	N/A
R5 – Residence at 1417 69th Ave E	7/22/15	11:07	70.1	71.3	1.2
R6 – Apartments at 6643 20th St E	7/22/15	12:24	64.4	66.4	2.0
R7 – Residence at 5307 St	9/2/15	10:13	53.8	55.4	1.6
R8 – Residence at 74th & Valley Rd	9/2/15	11:02	62.4	62.4	0.0
R9 – Residence at 4525 Freeman Rd E	9/2/15	11:48	61.0	N/A	N/A
R10 – Residence at 5822 108th Ave Ct E	11/10/15	10:20	63.6	62.4	-1.2
R11 – Residence at 5919 106th Ave Ct E	11/10/15	10:50	62.4	60.6	-1.8
R12 – 11714 Houston Rd E	11/10/15	11:30	69.3	67.3	-2.0
R13 - Residence at 11720 59th St Ct E	11/10/15	12:00	68.7	68.0	-0.7
R14 – 4328 12th St E	11/10/15	12:45	58.5	57.8	-0.7

Loudest hour measured noise levels were used for existing peak-hour noise levels at Sites R2, R3, R4, and R9.

Twenty-four hour noise measurements were collected to determine the existing peak-hour noise levels at Sites R2, R3, R4, and R9 as traffic noise was not readily discernable at these sites, which are located farther from existing roadways. Appendix E contains field data sheets for all 14 measurement locations, including traffic data counted during short-term measurements. Additional receivers were added to the model to represent outdoor use locations at noise sensitive locations in the study area. Along with the fourteen measured sites, seventy-eight total sites were modeled to represent the outdoor use areas for all noise sensitive locations within the study area. The location of the 14 noise measurement sites and additional modeled only sites are shown in Exhibit 3 Maps (four pages).

11 **Exhibit 3: Noise Modeling Sites and Noise Impacts Results Maps**



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13 **Exhibit 3: Noise Modeling Sites and Noise Impacts Results Maps (continued)**

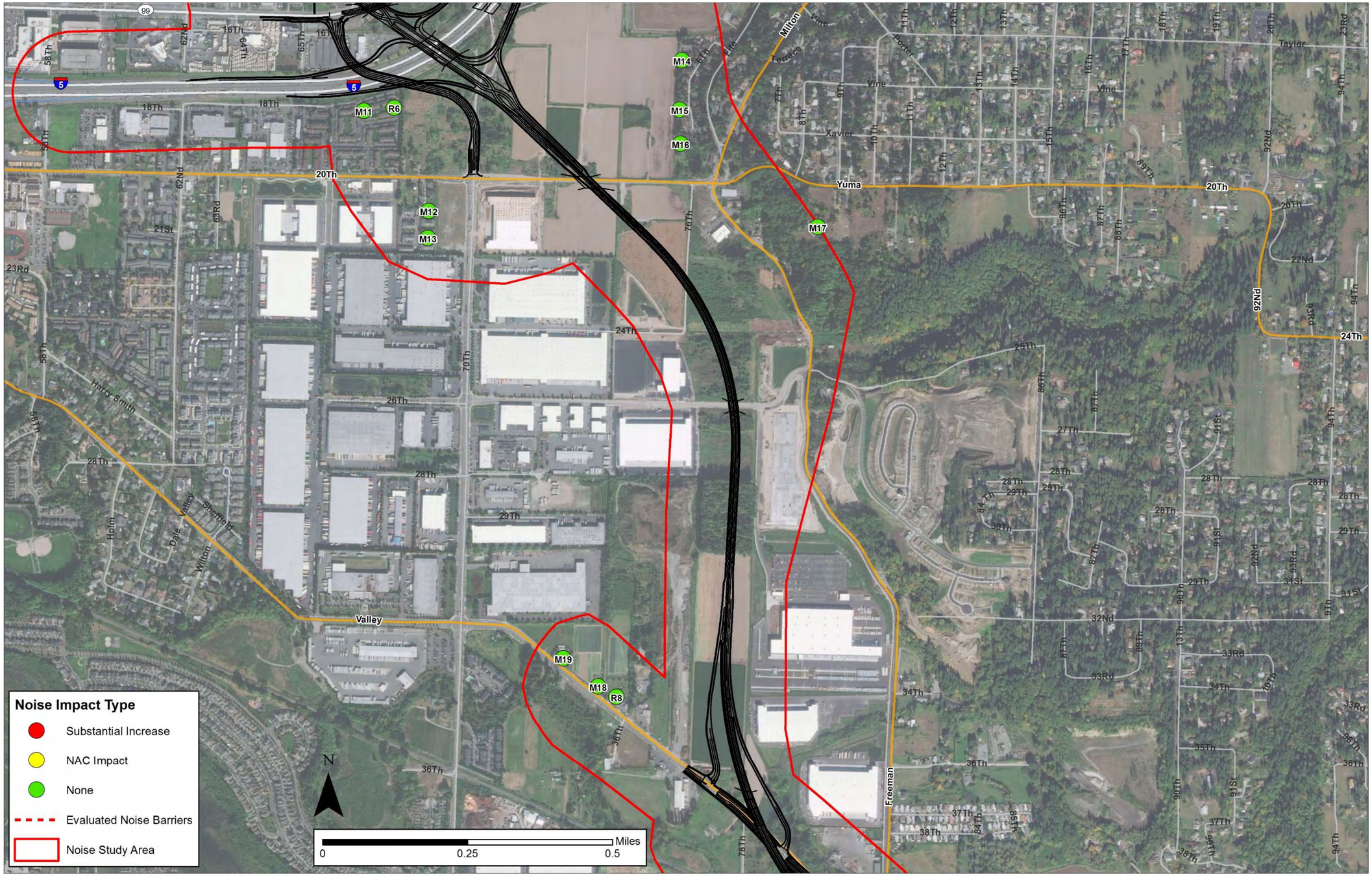

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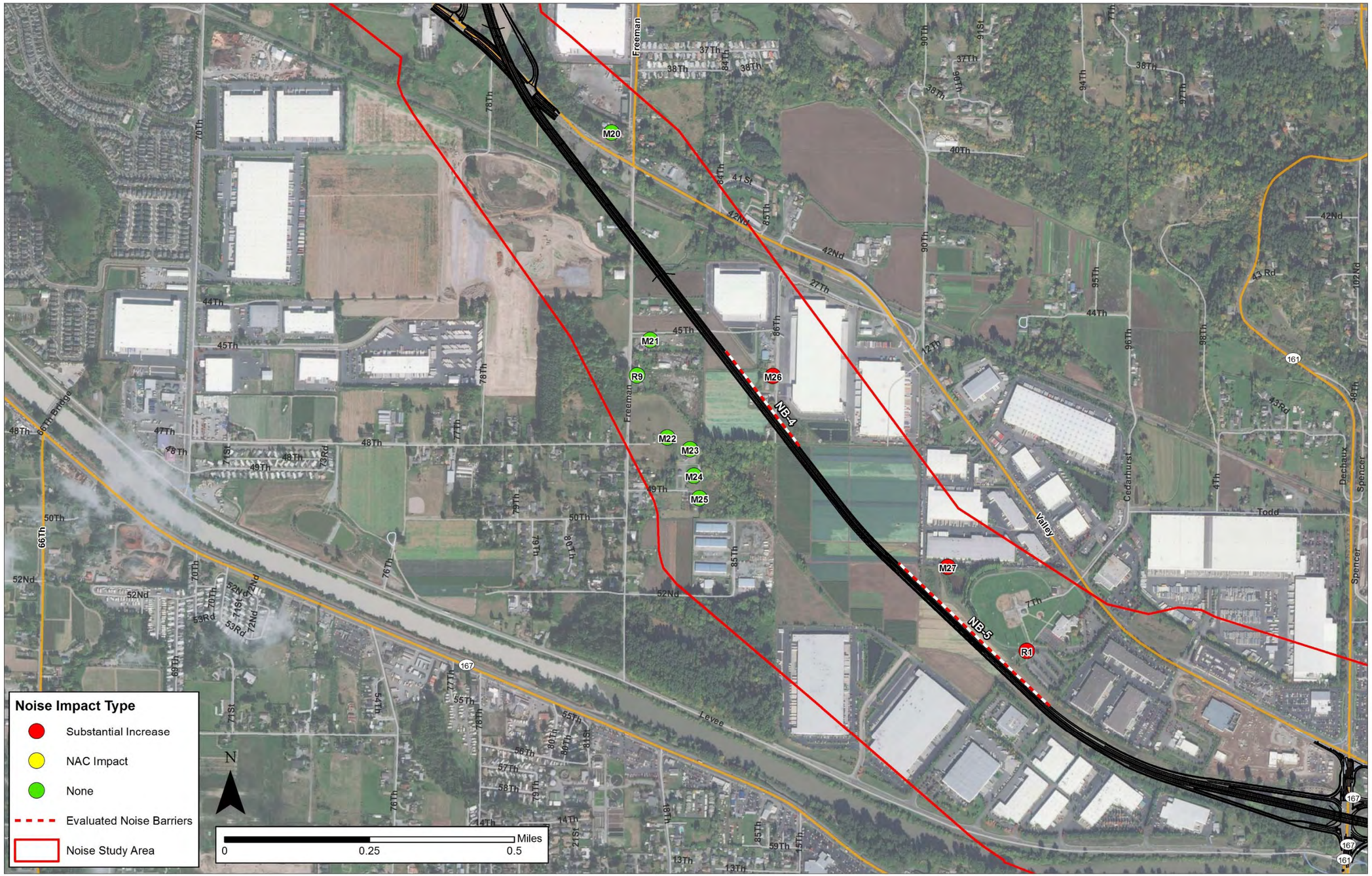
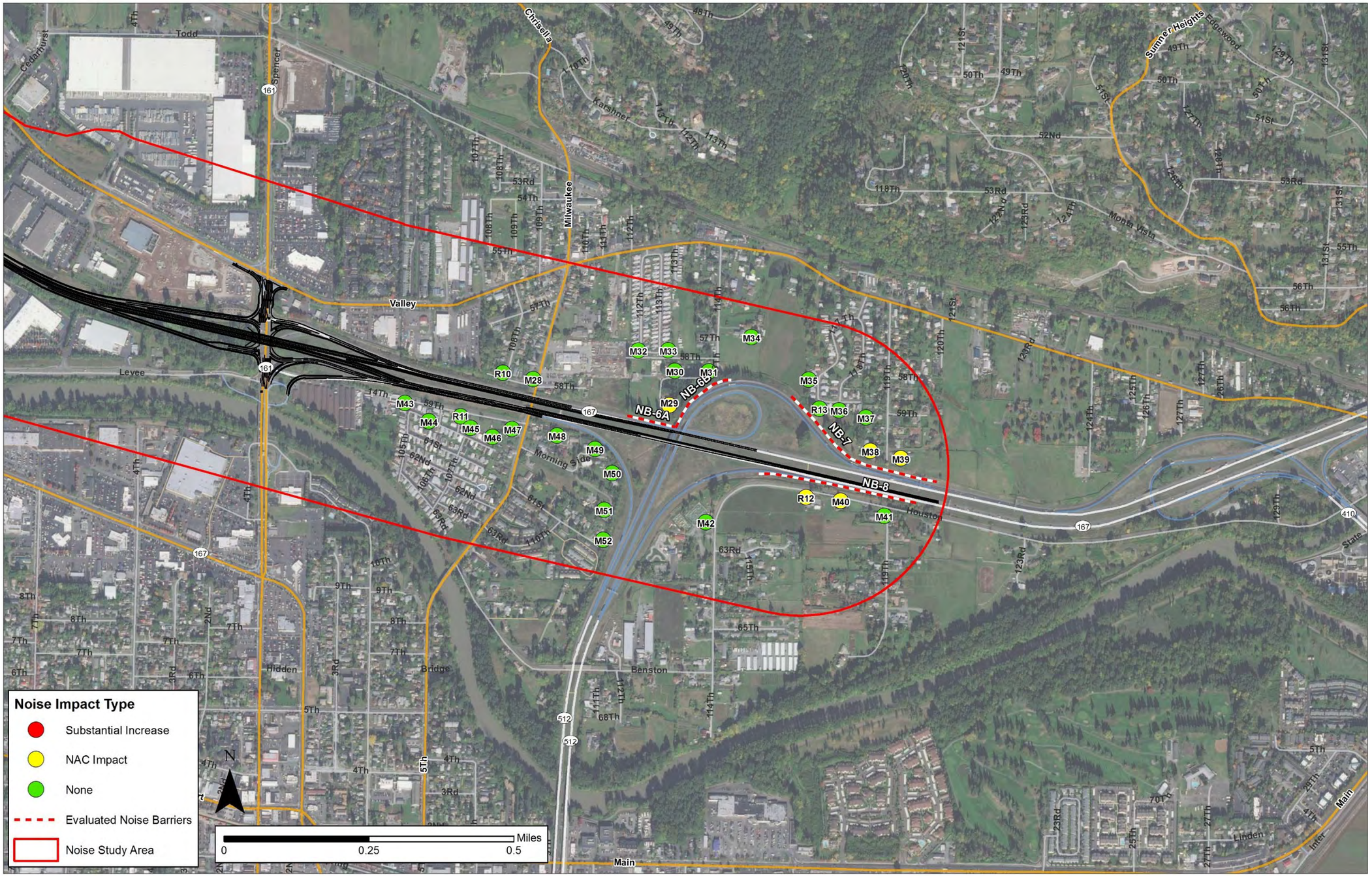
Exhibit 3: Noise Modeling Sites and Noise Impacts Results Maps (continued)



18 **Exhibit 3: Noise Modeling Sites and Noise Impacts Results Maps (continued)**



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Traffic Noise Levels

Model operational traffic noise levels have changed since the 2006 FEIS. Existing (2015), No Build (2045), and Build (2045) noise levels were modeled to represent properties that could potentially be affected by noise from the project. The modeling locations represent outdoor areas of frequent human use, such as common, ground-floor use areas, private balconies at multi-family residential buildings, trails, nature areas or benches at parks and outside commercial or office buildings.

Predicted noise levels were based on maximum capacity traffic volumes per hour during free flowing traffic conditions to estimate Existing Conditions 2015 and future year 2045 noise levels with Build and without the project (No Build). See Exhibit 5. Note, traffic information, including volume, and vehicle mix data for existing and future traffic conditions with and without the project, is included in Appendix B. A summary of impacts by condition is presented here:

- Existing condition (2015) noise abatement criteria impacts—51 residences and one trail (Interurban Trail) represented by 19 modeling sites would approach or exceed the NAC.
- No Build (2045) noise abatement criteria impacts—51 residences and one trail (Interurban Trail) represented by 19 modeling sites (same locations as existing condition) would approach or exceed the NAC.
- Proposed Phase 1 Build (2045) noise abatement criteria impacts—20 residences represented by 8 modeling sites would approach or exceed the NAC.
- Proposed Phase 1 Build (2045) substantial increase impact—5 residences and the Puyallup Recreation Center and trail represented by 5 modeling sites would experience a noise level increase 10 dBA or greater over existing noise levels.

Of the Proposed Phase 1 Build (2045) impacts listed above, none of the modeled sites are predicted to experience both noise abatement criteria impacts and substantial increase impacts.

Existing Operational Noise Levels

Existing modeled worst-hour traffic noise levels for residential areas range from 44 dBA to 74 dBA, as shown in Exhibit 4. The modeled noise levels at these receivers depend on the proximity of the receiver to the existing roadways, primarily I-5, SR 99, SR 509, and SR 167 between. Of the 78 total modeled receivers, 19 receivers currently experience traffic noise levels above the NAC of 66 dBA. The 19 receivers represent 51 residences and the Interurban Trail. Existing traffic noise levels for all modeled receivers are shown in Exhibit 4.

Exhibit 4: Modeled Noise Levels

Site ID	Land Use	NAC[1] (Leq) (dBA)/ Land Use Category	Dwelling Units/ Residential Equivalency[2]	Existing 2015 (Leq) (dBA)	No-Build 2045 (Leq) (dBA)	Build without barriers 2045 (Leq) (dBA)
R1	Park	66/C	3	46	46	**65***
R2	Residential	66/B	2	51	51	**62***
R3	Residential	66/B	2	52	52	59
R4	Residential	66/B	1	55	55	54

Site ID	Land Use	NAC[1] (Leq) (dBA)/ Land Use Category	Dwelling Units/ Residential Equivalency[2]	Existing 2015 (Leq) (dBA)	No-Build 2045 (Leq) (dBA)	Build without barriers 2045 (Leq) (dBA)
R5	Residential	66/B	3	**72**	**72**	**68**
R6	Multi-Family/ Residential	66/B	8	**68**	**68**	63
R7	Residential	66/B	1	54	54	59
R8	Residential	66/B	1	63	63	57
R9	Residential	66/B	1	61	61	56
R10	Residential	66/B	1	64	64	63
R11	Residential	66/B	7	61	61	61
R12	Residential	66/B	2	**66**	**66**	**67**
R13	Residential	66/B	2	**66**	**66**	64
R14	Residential	66/B	2	53	53	55
M1	Institutional	66/B	23	57	57	59
M2	Residential	66/B	2	50	50	58
M3	Residential	66/B	3	49	49	55
M4	Residential	66/B	1	51	51	**63***
M5	Residential	66/B	1	50	50	51
M6	Residential	66/B	2	51	51	53
M7	Residential	66/B	1	53	53	54
M8	Residential	66/B	1	55	55	55
M9	Multi-Family/ Residential	66/B	2	58	58	57
M10	Multi-Family/ Residential	66/B	2	58	58	59
M11	Multi-Family/ Residential	66/B	8	59	59	59
M12	Multi-Family/ Residential	66/B	8	56	56	56
M13	Multi-Family/ Residential	66/B	8	55	55	55
M14	Multi-Family/ Residential	66/B	4	54	54	54
M15	Residential	66/B	9	53	53	54
M16	Residential	66/B	4	52	52	55
M17	Residential	66/B	1	48	48	51
M18	Residential	66/B	1	65	65	59
M19	Residential	66/B	1	65	65	58
M20	Residential	66/B	2	61	61	62
M21	Residential	66/B	1	54	54	59
M22	Residential	66/B	1	49	49	55

Site ID	Land Use	NAC[1] (Leq) (dBA)/ Land Use Category	Dwelling Units/ Residential Equivalency[2]	Existing 2015 (Leq) (dBA)	No-Build 2045 (Leq) (dBA)	Build without barriers 2045 (Leq) (dBA)
M23	Residential	66/B	1	47	47	55
M24	Residential	66/B	1	46	46	54
M25	Residential	66/C	1	46	46	53
M26	Residential	66/B	2	44	44	**63***
M27	Park and Trail	66/B	1	44	44	**63***
M28	Residential	66/B	2	**66**	**66**	63
M29	Residential	66/B	1	**68**	**67**	**68**
M30	Residential	66/B	2	61	61	61
M31	Residential	66/B	2	61	61	60
M32	Residential	66/B	2	58	58	58
M33	Residential	66/B	2	58	58	58
M34	Residential	66/B	2	58	58	57
M35	Residential	66/B	6	61	61	61
M36	Residential	66/B	7	62	62	61
M37	Residential	66/B	2	60	60	60
M38	Residential	66/B	2	**68**	**68**	**68**
M39	Residential	66/B	2	**67**	**67**	**67**
M40	Residential	66/B	1	**67**	**67**	**68**
M41	Residential	66/B	2	**66**	**66**	65
M42	Residential	66/B	1	62	62	60
M43	Residential	66/B	2	62	62	62
M44	Residential	66/B	5	61	61	62
M45	Residential	66/B	4	61	61	60
M46	Residential	66/B	4	60	60	60
M47	Residential	66/B	3	62	62	60
M48	Residential	66/B	3	64	64	60
M49	Residential	66/B	2	**68**	**68**	62
M50	Residential	66/B	2	**67**	**67**	62
M51	Residential	66/B	2	63	62	61
M52	Residential	66/B	1	64	64	63
M53	Residential	66/B	2	49	49	52
M54	Residential	66/B	2	49	49	51
M55	Residential	66/B	2	50	50	51
M56	Residential	66/B	2	**68**	**68**	64
M57	Residential	66/B	3	**74**	**74**	**70**
M58	Residential	66/B	4	**69**	**69**	63

Site ID	Land Use	NAC[1] (Leq) (dBA)/ Land Use Category	Dwelling Units/ Residential Equivalency[2]	Existing 2015 (Leq) (dBA)	No-Build 2045 (Leq) (dBA)	Build without barriers 2045 (Leq) (dBA)
M59	Residential	66/B	5	**68**	**68**	63
M60	Residential	66/B	2	**70**	**70**	65
M61	Multi-Family/ Residential	66/B	6	**71**	**71**	**67**
T1	Trail (Hylebos Wildlife Trail)	66/C	1	49	49	56
T2	Trail (Interurban Trail)	66/C	1	**66**	**66**	62
T3	Trail (Milgard Nature Reserve)	66/C	1	51	51	60

*Impacts are noted by bolded values (*substantial increase)*

[1] 66 dBA is the approach limit for the activity categories B and C NAC of 67 dBA. See Exhibit 1 for definitions of Activity Categories.

[2] Appendix F provides Residential Equivalency Calculations for R1, M27, T1 and T2.

Design Year (2045) Traffic Noise Levels—No Build

Future No Build modeled worst-hour traffic noise levels for residential areas range from 44 dBA to 74 dBA. The modeled noise levels at these receivers depend on the proximity of the receiver to the existing roadways, primarily I-5, SR 99, SR 509, and SR 167 between SR 512 and SR 161 (Meridian). Of the 78 total receivers, 19 receivers currently experience traffic noise levels above the NAC of 66 dBA, and are predicted to continue to experience traffic noise levels above the NAC of 66 dBA without the proposed SR 167 Project's Phase 1 Improvements in 2045. The 19 receivers represent the same 51 residences and trail as described for impacts under existing conditions. Roadway traffic noise levels under the No Build Alternative would not result in a noticeable change over time due to the relatively small change in peak-hour traffic volumes on the existing roadway network. The No Build traffic noise levels in the year 2045 for most modeled receivers would be within 1 dBA of existing noise levels. Future No Build traffic noise levels are shown in Exhibit 4.

Design Year (2045) Traffic Noise Levels—Build

Future Build modeled loudest-hour traffic noise levels for residential areas range from 51 dBA to 70 dBA. The modeled noise levels at these receivers depend on the proximity of the receiver to the existing roadways (I-5, SR 99, SR 509, and the existing SR 167 alignment) and the new SR 167 freeway. Of the 78 total receivers, 8 receivers representing 20 residences would experience traffic noise levels above 66 dBA (approach or exceed the NAC) and 5 receivers representing 5 residences and the Puyallup Recreation Center and trail would experience a substantial increase of 10 dBA or greater over existing noise levels.

Roadway traffic noise levels under the proposed Phase 1 would result in a noticeable change in some areas once the project is in operation. Traffic noise levels would increase throughout the project corridor in areas in close proximity to the new SR 167 freeway. Traffic noise levels would be similar to existing traffic noise levels in areas farther from the new SR 167 freeway and any change in noise levels would reflect traffic volume changes along the existing roadway network. Changes in the Build traffic noise levels in 2045 for all modeled receivers would range from a 7 dBA decrease to a 19 dBA increase

compared to existing conditions and 2045 traffic noise levels for the No Build Alternative. Future Build traffic noise levels at most modeled receivers would be within 10 dBA of existing noise levels. The highest predicted increases in future Build traffic noise levels (19 dBA over existing noise levels) are a 63 dBA to 65 dBA future traffic noise level predicted at the Puyallup Recreation Center, trail and two nearby residences represented by Sites R1, M26 and M27. Future Build traffic noise levels are shown in Exhibit 4.

Traffic Noise Abatement

The traffic noise abatement background described in the Noise Technical Report (February 2004) referenced in the 2006 FEIS remains applicable to the Phase 1 improvements. However, determination of feasibility, determination of reasonableness, and recommendation for traffic noise abatement has changed since 2006.

Noise abatement, including noise barrier evaluation, is necessary only where frequent human use occurs and where a lower noise level would provide benefits (FHWA 2010). To be effective, the barrier must block the line-of-sight between the highest point of a noise source and the receptor. It must be long enough to prevent sounds from passing around the ends, have no openings (i.e., side streets), and be dense enough so that noise will not be transmitted through it. Intervening rows of buildings that are not noise sensitive could also be used as barriers (FHWA 2010).

Abatement was considered for this project because traffic noise impacts are predicted to approach or exceed the NAC or would experience a noise level increase 10 dBA or greater over existing noise levels at 13 modeled sites. The 13 modeled sites are representative of nine discrete areas where noise barrier placement was considered. All nine areas where impacts are predicted were evaluated to determine if a feasible noise barrier could be constructed as described below.

Feasibility

Feasibility is a combination of acoustic and engineering considerations. All of the following must occur for potential abatement (e.g., noise barrier) to be considered feasible:

- Abatement must be physically constructible.
- The majority of first row receivers experiencing noise impacts must obtain a minimum 5 dBA of noise reduction as a result of abatement (insertion loss), assuring that every reasonable effort will be made to assess outdoor use areas as appropriate.

For this project, noise barriers were evaluated at 9 locations to determine whether abatement could sufficiently reduce traffic noise levels. Noise barriers were evaluated along the new proposed Phase 1 SR 167 extension in several locations. Each evaluated noise barrier location is described below and includes consideration of multiple barrier heights and lengths in an attempt to achieve WSDOT criteria for feasibility and reasonableness. Noise barriers locations are shown in Exhibit 3.

Noise Barrier 1—Sites R2, M2, and M3

Noise Barrier 1 was evaluated along new northbound proposed SR 167 lanes west of I-5 and along the SR 167 northbound off-ramp to 54th Avenue East. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 20 feet tall and 1,108 feet long in this

location; a 5-dBA reduction was achieved at Site R2 located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 1 would meet the feasibility criteria.

Noise Barrier 2—Site R3 and M4

Noise Barrier 2 was evaluated along new southbound SR 167 lanes west of I-5 and along the SR 167 southbound mainline. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 20 feet tall and 1,258 feet long in this location; a 5-dBA reduction was achieved at Site M4 located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 2 would meet the feasibility criteria.

Noise Barrier 3—Site R5, M56, M57, M58, M59, and M60

Noise Barrier 3 was evaluated along the private property line between homes and the vacant land north of the future I-5/SR 167 Interchange at 69th Avenue East. The location of the noise barrier is shown on Exhibit 3. This location was chosen for evaluation because the homes in this area are predicted to receive traffic noise from various roadways included in the new interchange and this noise barrier location would most effectively reduce noise levels. A minimum feasible barrier 8 feet tall and 1,038 feet long would reduce traffic noise levels by at least 5 dBA at the majority of first row receiver locations in this area.

Noise Barrier 3 would meet the feasibility criteria.

Noise Barrier 4—Site M26

Noise Barrier 4 was evaluated along new northbound SR 167 lanes west of SR 161 and along the SR 167 northbound mainline. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 20 feet tall and 1,705 feet long in this location; a 5-dBA reduction was achieved at the majority of first row homes located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 4 would meet the feasibility criteria.

Noise Barrier 5—Sites R1 and M27

Noise Barrier 5 was evaluated along new northbound SR 167 lanes west of SR 161 and along the SR 167 northbound mainline. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 12 feet tall and 1,898 feet long in this location; a 5-dBA reduction was achieved at the majority of first row homes located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 5 would meet the feasibility criteria.

Noise Barriers 6A and 6B—Sites M29, M30, M31, M32, and M33

Noise Barriers 6A and 6B were evaluated along new northbound SR 167 lanes west of SR 512. Noise Barrier 6A is located along SR 167 and Noise Barrier 6B was evaluated along the SR 167 northbound off-ramp to SR 512. The location of the noise barriers is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 14 feet tall and 1,330 feet long in this location; a 5-dBA reduction was achieved at the majority of first row homes located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barriers 6A and 6B would meet the feasibility criteria.

Noise Barrier 7—Sites R13, M35, M36, M37, M38, and M39

Noise Barrier 7 was evaluated along northbound SR 167 lanes east of SR 512 and along the SR 167 northbound off-ramp to SR 512. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 14 feet tall and 1,706 feet long in this location; a 5-dBA reduction was achieved at the majority of first row homes located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 7 would meet the feasibility criteria.

Noise Barrier 8—Sites R12, M40, and M41

Noise Barrier 8 was evaluated along southbound SR 167 lanes east of SR 512 and along the southbound on-ramp and mainline SR 167. The location of the noise barrier is shown on Exhibit 3. Noise barrier options were evaluated at heights up to 10 feet tall and 1,800 feet long in this location; a 5-dBA reduction was achieved at the majority of first row homes located behind the noise barrier to satisfy WSDOT feasibility.

Noise Barrier 8 would meet the feasibility criteria.

Noise Barrier 9A, 9B and 9C—Site M61

Noise Barrier 9A was evaluated along the right-of-way on the east side of the I-5, just south of Porter Way (NB 9A) and along the property line adjacent to the SR99 (NB 9B & 9C) as a system. The location of the noise barrier is shown on Exhibit 3. This location was chosen for evaluation of the planned Telecare Residential Treatment Facility. This area is predicted to receive traffic noise from SR 99 and the I-5, thus a single barrier along I-5 would not provide enough noise mitigation. Noise Barriers 9B and 9C would could also represent any of the shielding effects that the Facility's building(s) could provide from noise from SR 99. These noise barrier locations would most effectively reduce noise levels. A barrier from 6 to 20 feet tall was modeled for this area but did not reduce noise levels by at least 5 dBA at the majority of first row receiver locations in this area.

Noise Barrier 9 would not meet the feasibility criteria.

Feasibility Results

Feasibility results are detailed in Exhibit 5. Eight of the nine noise barriers evaluated were found to be feasible.

Exhibit 5: Feasibility Analysis

Site (Land Use Category) – and Evaluated Noise Barrier(s)[1]	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	1st Row?	Min. Design Goal NW		Feasible? Yes/No
				Insertion Loss (dBA)	% 1st Row ≥ 5 dBA	
R2 (B)—Noise Barriers 1	51	**62**	Yes	5	100 %	Yes
M4 (B)—Noise Barrier 2	51	**63**	Yes	7	100 %	Yes
M57 (B)—Noise Barrier 3	**74**	**70**	Yes	10	100 %	Yes
M26 (B)—Noise Barrier 4	44	**63**	Yes	5	100 %	Yes
R1 (C)—Noise Barrier 5	46	**65**	Yes	6	100 %	Yes
M29 (B)—Noise Barrier 6A & 6B	**67**	**68**	Yes	8	100 %	Yes
M38 (B)—Noise Barrier 7	**68**	**68**	Yes	5	100 %	Yes
M40 (B)—Noise Barrier 8	**67**	**68**	Yes	5	100 %	Yes
M61 (B)—Noise Barrier 9A, 9B & 9C	**71**	**67**	Yes	2	0%	No

See Exhibit 1 for definitions of Activity Categories.
[1] Site shown in one site behind evaluated noise barrier that satisfies feasibility criteria.

Reasonableness of Noise Barriers

Since potential abatement is feasible at eight locations (Noise Barriers 1, 2, 3, 4, 5, 6AB, 7, and 8), the reasonableness of abatement was evaluated at each location. Noise walls, or other types of abatement, will only be constructed by WSDOT if they have been determined to be reasonable by satisfying three criteria:

- Cost Effectiveness
- Design Goal Achievement
- Desire for Abatement from Public within the Noise Study Area

Cost Effectiveness

The cost of noise abatement sufficient to provide at least the minimum feasible noise reductions must be equal to or less than the allowable cost of abatement for each noise wall location analyzed. Based on noise wall costs from 2007 to 2010, the current average cost for Washington State is $51.61 per square foot ($ft^2$) of wall area (WSDOT 2012). The cost is applied to the allowed wall surface area (ft^2) to generate the allowable cost per qualified resident. The allowable cost per receiver, based on Build condition traffic noise levels is described in Exhibit 6.

Exhibit 6: Reasonableness Allowances

Design Year Traffic Sound Decibel Level (dBA)	Noise Level Increase as a Result of the Project (dBA) [2]	Allowed Wall Surface Area Per Qualified Residence or Residential Equivalent	Allowed Cost Per Qualified Residence or Residential Equivalent [1]
66		700 Square Feet	$36,127
67		768 Square Feet	$39,636
68		836 Square Feet	$43,146
69		904 Square Feet	$46,655
70		972 Square Feet	$50,165
71	10 (substantial, step 1) [3]	1,040 Square Feet	$53,674
72	11 (substantial, step 1)	1,108 Square Feet	$57,184
73	12 (substantial, step 1)	1,176 Square Feet	$60,693
74	13 (substantial, step 1)	1,244 Square Feet	$64,203
75	14 (substantial, step 1)	1,312 Square Feet	$67,712
76	15 (substantial, step 2) [4]	1,380 Square Feet	$71,222

[1] Current costs based on $51.61 per square foot constructed cost developed in 2011.
[2] If the noise level increases 10 dBA or more as the result of the project (Column B), regardless of Design Year traffic sound level, follow the allowed wall surface and cost for the level of increase in Column C in lieu of the total design year sound decibel level in Column A. For total highway related sound levels at 76 or more dBA or the project results in an increase of 15 or more decibels, continue increasing the allowance at the rate provided in the table unless circumstances determined on a case-by case basis require an alternative methodology for determining allowance.
[3] Step 1 is when the noise levels are 10 to 14 dBA over Existing condition traffic noise as a result of the transportation project.
[4] Step 2 is when the noise levels are 15 or more dBA over Existing condition traffic noise as a result of the transportation project (or total highway related noise levels are between 76 and 79 decibels). Additional consideration for abatement may be considered under these circumstances.

Design Goal Achievement

The minimum feasibility design goal for abatement on all projects is at least 5 dBA of noise reduction for the majority of impacted front row receivers and, for reasonableness, at least 7 dBA of reduction for one or more receivers. Noise walls cannot be recommended if they do not achieve the design goal. In addition to the design goal requirement, WSDOT makes a reasonable effort to get 10 dBA or greater insertion loss (noise reduction) at the first row of receivers for all projects where abatement is recommended.

Exhibit 7 through Exhibit 14 describe the allowable cost per receiver and the cost of the minimum barrier size to achieve the 7 dBA design goal at all feasible noise barriers. A barrier that gets 10 dBA of reduction for the majority of first row receivers was also evaluated.

Noise Barrier 1—Sites R2, M2, and M3

A minimum reasonable barrier dimension of 20 feet tall and 1,108 feet long for Noise Barrier 1 would not achieve at least a 7-dBA noise reduction at one location behind the wall. Furthermore, a noise barrier of this size is estimated to cost approximately $1,143,678.

Due to the allowable cost of Noise Barrier 1 being less than the construction cost of the barrier, and that the noise barrier would not achieve WSDOT's design goal of reducing traffic noise levels by at least 7 dBA at one site, Noise Barrier 1 does not meet WSDOT reasonableness, see Exhibit 7.

Exhibit 7: Reasonableness Evaluation for Cost—Noise Barrier 1

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 20-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
R2	2	51	**62**	$57,184	$114,368	$1,143,678	5
					Design Goal Achieved?	No	
					Cost Effective?	No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2

Noise Barrier 2—Site R3 and M4

A minimum reasonable barrier dimension of 14 feet tall and 1,258 feet long for Noise Barrier 2 would achieve at least a 7-dBA noise reduction at one location behind the wall. A noise barrier of this size is estimated to cost approximately $908,955. This barrier would benefit the residential equivalency of one residence, which results in a reasonable allowance of $60,693.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7-dBA at one site, due to the allowable cost of Noise Barrier 2 being less than the construction cost of the barrier, Noise Barrier 2 does not meet WSDOT reasonableness, see Exhibit 8.

Exhibit 8: Reasonableness Evaluation for Cost—Noise Barrier 2

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 14-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M4	1	51	**63**	$60,693	$60,693	$908,955	7
					Design Goal Achieved?	Yes	
					Cost Effective?	No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft2

Noise Barrier 3—Site R5, M56, M57, M58, M59, and M60

A minimum reasonable barrier dimensions of 10 feet tall and 1,038 feet long for Noise Barrier 3 would achieve at least a 7-dBA noise reduction at one location behind the wall. A noise barrier of this size is estimated to cost approximately $535,712. Noise Barrier 3 is located along the property line of the vacant shared property for the Fife Heights residents north of the future I-5/SR 167 Interchange Additional costs of placing the Noise Barrier 3 on property not owned by WSDOT has been included in this evaluation. Because the noise barrier is not located on WSDOT property, WSDOT estimates the cost of acquiring the right of way needed to build the barrier at $1,800,326, see Appendix G for right of way acquisition details. The total estimated cost to construct Noise Barrier 3 is approximately $2,336,038. This barrier would benefit the residential equivalency of 19 residences, which results in a reasonable allowance of $749,557.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7-dBA at one site, due to the allowable cost of Noise Barrier 3 being less than the construction cost of the barrier, Noise Barrier 3 does not meet WSDOT reasonableness.

WSDOT evaluated moving Noise Barrier 3 to two locations. The first would move Noise Barrier 3 along the I-5 off ramp, but this location would not be feasible as it would not provide at least a 5 dBA reduction to first row homes. The second location would move Noise Barrier 3 to the edge of SR 99 and would be feasible, but it would not be reasonable as this barrier would benefit the residential equivalency of 6 residences, which results in a reasonable allowance of $290,460, but would have a cost of $886,660. See Appendix H for additional information on moving Noise Barrier 3.

Exhibit 9: Reasonableness Evaluation for Cost—Noise Barrier 3

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 10-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M56	2	**68**	64	$36,127	$749,557	$2,336,038	7
R5	3	**72**	**68**	$43,146			9
M57	3	**74**	**70**	$50,156			12
M58	4	**69**	63	$36,127			4
M59	5	**68**	63	$36,127			5
M60	2	**70**	65	$36,127			5
Design Goal Achieved?						Yes	
Cost Effective?						No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft²

Noise Barrier 4—Site M26

A minimum reasonable barrier dimension of 18 feet tall and 1,705 feet long for Noise Barrier 4 would achieve at least a 7-dBA noise reduction at one location behind the wall . A noise barrier of this size is estimated to cost approximately $1,583,911. This barrier would benefit the residential equivalency of 6 residences, which results in a reasonable allowance of $170,520.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7-dBA at one site, due to the allowable cost of Noise Barrier 4 being less than the construction cost of the barrier, Noise Barrier 4 does not meet WSDOT reasonableness

Exhibit 10: Reasonableness Evaluation for Cost—Noise Barrier 4

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 18-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M26	2	44	**63**	$85,260	$170,520	$1,583,911	7
Design Goal Achieved?						Yes	
Cost Effective?						No	

*Impacts are noted by bolded values (*substantial increase)*
Reasonableness cost based on $51.61/ft²

Noise Barrier 5—Sites R1 and M27

A minimum reasonable barrier dimension of 12 feet tall and 1,898 feet long for Noise Barrier 5 would achieve at least a 7-dBA noise reduction at one location behind the wall. A noise barrier of this size is estimated to cost approximately $1,175,469. This barrier would benefit the residential equivalency of five residences, which results in a reasonable allowance of $341,040.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7 dBA at one site, due to the allowable cost of Noise Barrier 5 being less than the construction cost of the barrier, Noise Barrier 5 does not meet WSDOT reasonableness.

Exhibit 11: Reasonableness Evaluation for Cost—Noise Barrier 5

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 12-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
R1	3[1]	46	**65**	$85,260	$341,040	$1,175,469	7
M27	1[1]	44	**63**	$85,260			5
					Design Goal Achieved?	Yes	
					Cost Effective?	No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2
[1] Appendix F provides Residential Equivalency Calculations for R1 and M27.

Noise Barrier 6A and 6B—Sites M29, M30, M31, M32, and M33

A minimum reasonable barrier dimension of 14 feet tall and 1,330 feet long for Noise Barriers 6A and 6B would achieve at least a 7-dBA noise reduction at one location behind the wall. Noise barriers of this size are estimated to cost approximately $960,978. This barrier would benefit the residential equivalency of five residences, which results in a reasonable allowance of $187,654.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7 dBA at one site, due to the allowable cost of Noise Barriers 6A and 6B being less than the construction cost of the barriers, Noise Barrier 6A and 6B do not meet WSDOT reasonableness.

Exhibit 12: Reasonableness Evaluation for Cost—Noise Barriers 6A and 6B

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 14-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M29	1	**68**	**68**	$43,146	$187,654	$960,978	8
M30	2	61	61	$36,127			5
M31	2	61	60	$36,127			5
					Design Goal Achieved?	Yes	
					Cost Effective?	No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2

Noise Barrier 7—Sites R13, M35, M36, M37, M38, and M39

A minimum reasonable barrier dimension of 14 feet tall and 1,706 feet long for Noise Barrier 7 would achieve at least a 7-dBA noise reduction at one location behind the wall. A noise barrier of this size is estimated to cost approximately $1,232,653. This barrier would benefit the residential equivalency of 21 residences, which results in a reasonable allowance of $779,723.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7 dBA at one site, due to the allowable cost of Noise Barrier 7 being less than the construction cost of the barrier, Noise Barrier 7 does not meet WSDOT reasonableness.

Exhibit 13: Reasonableness Evaluation for Cost—Noise Barrier 7

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 14-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M38	2	**68**	**68**	$43,146	$779,723	$1,232,653	8
M39	2	**67**	**67**	$39,636			8
R13	2	**66**	**64**	$36,127			8
M35	6	**61**	**61**	$36,127			6
M36	7	**62**	**61**	$36,127			5
M37	2	**60**	**60**	$36,127			5
Design Goal Achieved?						Yes	
Cost Effective?						No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2

Noise Barrier 8—Sites R12, M40, and M41

A minimum reasonable barrier dimension of 10 feet tall and 1,800 feet long for Noise Barrier 8 would achieve at least a 7-dBA noise reduction at one location behind the wall. A noise barrier of this size is estimated to cost approximately $928,980. This barrier would benefit the residential equivalency of four residences, which results in a reasonable allowance of $194,672.

Although the noise barrier would achieve WSDOT's design goal of reducing traffic noise levels by at least 7 dBA at one site, due to the allowable cost of Noise Barrier 8 being less than the construction cost of the barrier, Noise Barrier 8 does not meet WSDOT reasonableness.

Exhibit 14: Reasonableness Evaluation for Cost—Noise Barrier 8

Site	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 10-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
R12	2	**66**	**67**	$39,636	$194,672	$928,980	6
M40	1	**67**	**68**	$43,146			7
M41	2	**66**	65	$36,127			7
					Design Goal Achieved?	Yes	
					Cost Effective?	No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2

Desire for Abatement from Public within the Noise Study Area

Public involvement must occur when traffic noise abatement is recommended for Type 1 projects, even when public involvement is not required as part of the NEPA or SEPA processes (WSDOT 2012). Public opinion must be considered when making a determination of reasonableness for traffic noise abatement. Noise abatement will not be planned if more than 50 percent of eligible property owners oppose the proposed noise abatement.

Construction Noise

The current regulatory requirements and noise level limits during construction are consistent with those documented in the 2006 FEIS.

Traffic noise and construction noise are exempt from the property line noise limits during daytime hours, but noise limits still apply to construction noise at night. Noise levels in Exhibit 15 apply only to construction noise at residential properties during nighttime hours, between 10 p.m. and 7 a.m. At night, construction noise must meet property line regulations (Chapter 173-60 WAC) that set limits based on the Environmental Designation for Noise Abatement (EDNA) of the land use: residential (Class A), commercial (Class B), and industrial (Class C). If nighttime construction is required for this project, WSDOT (or the contractor, dependent on specific Contract requirements) will apply for variances or exemptions from local noise ordinances for the night work. Noise variances or exemptions require construction noise abatement measures that vary by jurisdiction. If night work is necessary for this project, noise variances are needed from the appropriate city or county agency.

Allowable nighttime (10:00 PM to 7:00 AM) noise levels at Class A receiving properties (residential) are reduced by 10 dBA.

Exhibit 15:Maximum Permissible Environmental Noise Levels

EDNA of Noise Source	EDNA of Receiving Property (dBA)		
	Class A	Class B	Class C
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70

Short-term exceedance of the sound levels in Exhibit 15 is allowed (Chapter 173-60). During any one-hour period, the maximum level may be exceeded by:

- 5 dBA for a total of 15 minutes,
- 10 dBA for a total of 5 minutes, or
- 15 dBA for a total of 1.5 minutes.

4. Would the Phase 1 Improvements result in any new or significant impacts?

The SR 167 Project's Phase 1 Improvements would not result in any new or significant impacts as compared to the 2006 FEIS Build Alternative. Noise levels would decrease as compared to the 2006 FEIS Build Alternative due to the smaller project footprint and lower predicted traffic volumes on SR 167. This analysis identified impacts at two additional sites (R5 and M57) as compared to the 2006 FEIS Build Alternative. This site was not included in the 2006 FEIS analysis as the Fife Heights residences represented by sites R5 and M57 were not built at the time of the 2006 FEIS. A noise barrier was evaluated at this location and WSDOT found that this noise barrier would not meet WSDOT Reasonableness Criteria.

The new construction noise analysis is consistent with the 2006 Tier II FEIS Noise Analysis. Construction creates temporary noise and the new Phase 1 Improvements would not result in a significant environmental impact regarding construction noise.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Noise abatement was evaluated for the locations where traffic noise impacts were predicted. No locations met both WSDOT Feasibility and Reasonableness Criteria.

A noise barrier along the south shoulder of existing SR 167 west of Milwaukee Avenue East was found to be feasible and reasonable in the 2006 FEIS. The Phase 1 Improvements would have a smaller footprint as compared to the 2006 FEIS Build Alternative, and the current 2017 noise analysis showed levels in this area were predicted to be below the NAC, therefore a noise barrier was not evaluated in this area.

These findings and recommended mitigation are consistent with the 2006 Tier II FEIS Noise Analysis. The new proposed Phase 1 Improvements would not result in a significant environmental impact regarding operational noise.

Abatement Recommended

Noise abatement was evaluated at locations where traffic noise impacts were predicted. No noise barriers met both WSDOT criteria for the placement of a feasible and reasonable noise barrier.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects of noise discussed in the 2006 FEIS remain applicable to the proposed Phase 1 Improvements except that the improvements would result in less area of impact and be of shorter duration than the 2006 FEIS Build Alternative.

Construction creates temporary noise. Construction is usually carried out in reasonably discrete steps, each with its own mix of equipment and noise characteristics. For example, construction of this project requires asphalt removal, grading, paving, restriping, deep foundations, bridge construction, retaining walls, drainage systems, utility relocations, and temporary detours just to name a few.

The most constant noise source at construction sites is usually engine noise. Mobile equipment generally operates intermittently or in cycles of operation, while stationary equipment, such as generators and compressors, generally operate at fairly constant sound levels. Trucks are present during most phases of construction and are not confined to the project site, so noise from trucks may affect more receivers than other construction noise. Other common noise sources include impact equipment, which could be pneumatic, hydraulic, or electric powered.

Noise levels during the construction period depend on the type, amount, and location of construction activities.

- The type of construction methods establish the maximum noise levels.
- The amount of construction activity establishes how often certain construction noises occur throughout the day.
- The location of construction equipment relative to adjacent properties determines the effect of distance in reducing construction noise levels.

Areas where concrete and asphalt are planned for removal will typically generate the highest noise levels during project construction. Noise generated by construction equipment likely to be used for this project include, trucks, graders, dozers, excavators, cranes, demolition equipment, concrete mixers, paving machines, and generators, which can reach levels of 77 dBA to 93 dBA at 50 feet. As a point source, construction noise decreases by 6 dBA per doubling of distance moving away from the equipment source. The various pieces of equipment are almost never operating simultaneously at full-power and some will be turned off, idling, or operating at less than full power at any time. Therefore, the average L_{eq} noise levels will be less than the aggregate of the maximum noise levels.

Construction noise is exempt from local noise ordinance regulations during daytime hours. If nighttime construction work between the hours of 10:00 PM and 7:00 AM is required for this project, WSDOT (or the Design-Builder, dependent on specific contract requirements) will apply for variances or exemptions from local noise ordinances for the night work. Noise variances or exemptions require construction noise abatement measures that vary by jurisdiction. If night work is necessary for this project, noise variances will be acquired from the appropriate city or county agency.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The mitigation measures as described in Section 3.6.6 of the 2006 FEIS remain applicable to the Phase 1 Improvements during construction. Construction noise can be reduced by using enclosures or walls to surround noisy equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment farther away from noise sensitive receivers, e.g., homes. The 2006 FEIS mitigation measures are all still applicable and relevant. The 2006 FEIS identified the following mitigation measures that could be incorporated into construction plans and special provisions to reduce construction noise impacts at nearby receptors (WSDOT 2006):

- Erecting noise berms and barriers as early as possible to provide noise shielding
- Limiting construction activities to between 7 a.m. and 10 p.m., to reduce construction noise level during nighttime hours in residential areas
- Equipping construction equipment engines with adequate mufflers, intake silencers, and engine enclosures. This could reduce their noise by 5 to 10 dBA (EPA 1971)
- Turning off construction equipment during prolonged periods of nonuse, to eliminate noise from construction equipment during those periods
- Requiring contractors to maintain all equipment and train their equipment operators, to minimize noise levels and increase operating efficiency
- Locating stationary equipment away from receiving properties to decrease noise from this equipment in relation to the increased distance
- Constructing temporary noise barriers or curtains around stationary equipment that must be located close to residences, to decrease noise levels at nearby sensitive receptors
- Discussing noise issues at the pre-construction stage and develop community involvement to identify haul roads and sensitive noise receptors
- Establishing the complaint mechanism during construction of the project

In addition to the construction noise mitigation measures identified in the 2006 FEIS, the following additional abatement measures can be incorporated into construction plans and contractor specifications to reduce construction noise at nearby receptors:

- Using haul vehicles with rubber bed-liners would reduce noise from loading trucks.
- Equipping trucks with ambient backup alarms would reduce the noise for equipment backing.
- Specifying the quietest equipment available would reduce noise by 5 to 10 Dba.
- Turning off construction equipment during prolonged periods of non-use would eliminate noise from construction equipment during those periods.

8. Conclusion

With adherence to the regulatory requirements described above, no new significant impacts to noise from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS.

A copy of this final Noise Technical Memorandum will be made available to local jurisdictions by WSDOT. The memo will serve to inform the local planning departments of the effects of the highway and highway-construction related noise in the area studied. The information contained within this memorandum can assist local officials in their planning process.

Based on the modeling results and future traffic volumes and speeds, areas within 350 feet of the proposed Phase 1 Improvements along SR 167, SR 509, or I-5 may experience noise levels that exceed the WSDOT residential noise abatement criteria of 66 dBA. Commercial areas located within 250 feet of I-5 may exceed the commercial abatement criteria of 71 dBA. Undeveloped lands located closer to these roadways would likely experience higher noise levels due to the higher traffic volumes on the new freeway. It is recommended that the local officials use this information as a guide when developing their future land use plans, zoning, or building code requirements.

9. References

Beranek, L.L. 1988. Noise and Vibration Control. Institute of Noise Control Engineering. McGraw Hill.

City of Edgewood, Online research to document permitted future development located near the SR 167: Tacoma to Puyallup New Freeway Project Area accessed online at: http://www.cityofedgewood.org/CURRENT%20PROJECT%20LIST%2010.09.17.pdf Accessed on November 27, 2017

City of Fife, Online research to document permitted future development located near the SR 167: Tacoma to Puyallup New Freeway Project Area accessed online at: http://cityoffife.org/city-departments/community-development/current-projects. Accessed on November 27, 2017.

City of Milton, Online information request sent to the City regarding future permitted development located near the SR 167: Tacoma to Puyallup New Freeway Project Area, October 2017. Response received on November 21, 2017.

City of Puyallup, Online information request sent to the City regarding future permitted development located near the SR 167: Tacoma to Puyallup New Freeway Project Area, October 2017. Response received on November 27, 2017.

City of Tacoma, Online research to document permitted future development located near the SR 167: Tacoma to Puyallup New Freeway Project Area accessed online accessed online at: http://tacomapermits.org/gis/Permits/index.html. Accessed on November 27, 2017.

Pierce County, Online research to document permitted future development located near the SR 167: Tacoma to Puyallup New Freeway Project Area accessed online accessed online at: https://palsonline.co.pierce.wa.us/palsonline/#/dashboard. Accessed on November 27, 2017.

U.S. Code of Federal Regulations (CFR) Part 772 (23 CFR Part 772), July 2010.

U.S. Department of Transportation, Federal Highway Administration directive "Highway Traffic Noise: Analysis and Abatement," Revised December 2010.

U.S. Department of Transportation, Federal Highway Administration, 1996. *Measurement of Highway-Related Noise*. Washington D.C.

U.S. Department of Transportation, Federal Highway Administration, 2002. *FHWA Traffic Noise Model User's Guide*. Washington D.C.

U.S. Department of Transportation, Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment*. Washington D.C.

U.S. Environmental Protection Agency, 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* Washington, D.C.

U.S. Environmental Protection Agency, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Report Number 550/9-74-004.

Washington Administrative Code, 2000. Chapter 173-60*. Maximum Environmental Noise Levels*. Olympia, Washington.

Washington State Department of Transportation (WSDOT), October 2012. *Traffic Noise Policy and Procedures.* Olympia, Washington.

Washington State Department of Transportation (WSDOT), February 2004. *State Route 167: State Route 509 to Puyallup Noise Technical Report.* Olympia, Washington.

Washington State Department of Transportation (WSDOT), 2006. *State Route 167: State Route 509 to Puyallup* Tier II Final EIS*.* Olympia, Washington.

Washington State Department of Transportation (WSDOT), Bicycle and Pedestrian Manual Counts. http://wsdot.maps.arcgis.com/home/webmap/viewer.html?layers=46a11f7e043842a5bfbbb1b69e7e4900. Last accessed October 2017.

Appendix A— Traffic Noise Analysis and Abatement Process

When are noise reports and/or recommendations final?

The noise abatement process from the preparation of a noise wall to the final noise wall design (or decision not to build) can be confusing. The following process attempts to provide some clarification to project teams and outlines a recommended "standard" process, but acknowledges that variations to this process are likely because of the differences between projects.

Environmental Discipline Reports

The noise analyst works with the project team to model project elements affecting noise that include traffic, topography, and the location of noise sensitive receivers. If traffic noise impacts are discovered through modeling, then abatement is evaluated.

Abatement is compared to the feasibility (constructability, effectiveness) and reasonableness (allowable barrier size/cost) for a "standard" project. If abatement is feasible and reasonable, the report recommends the optimal (cost to benefit) noise barrier.

The traffic noise discipline report or technical memo can be finalized.

Design Phase

Design Phase and Public Involvement steps (below) may be incorporated before report is finalized.

The project office reviews the recommended noise wall height and horizontal alignment to determine if there are any conflicts that were not realized at the time the discipline report was prepared.

If conflicts from utilities, steep slopes, etc. are present, the details and costs of the conflicts are provided to the noise analyst by the project team. The noise analyst will then add any additional ("but for" the noise wall) costs to the reasonableness evaluation.

If noise wall costs including accommodation of conflicts are still less than the allowable costs for the noise wall, the barrier height and/or alignment are re-evaluated and a new barrier will be recommended. If barrier costs plus the new costs exceed the allowable costs, the barrier may not be recommended by the WSDOT Air Noise and Energy (ANE) Program.

If a noise wall is recommended, the ANE Program will review and confirm noise wall dimensions throughout the design process.

Public Involvement

If abatement is recommended in the Traffic Noise Discipline Report or technical memo, public outreach to determine public desires for abatement must occur. The noise wall discussion may be introduced to the public before the Design Phase, but should happen after the noise wall alignment, height, and length

(or other abatement description) is established so that people can understand any effects of the noise wall (or other abatement) on their community.

The final determination whether to construct a noise wall or other abatement that is recommend in the traffic noise analysis, cannot be made until public outreach has occurred.

Final Steps

Any updates to the Traffic Noise Discipline report or technical memo to clarify changes that occurred during the Design Phase or from Public Involvement can be made at the project engineering offices discretion. Addendum or supplementary memorandum to clarify changes can also be added to the discipline report or project file.

The noise wall is constructed or a letter from the ANE Program is added to the project file clarifying why a noise wall was not constructed.

Appendix B— Traffic Data

2015 Existing Traffic Data

Roadway	Cars Per Lane	Medium Trucks Per Lane	Heavy Trucks per Lane
SB - ValleyAve to N Levee Rd	855	27	18
NB - ValleyAve to N Levee Rd	855	27	18
SB Freeman	665	21	14
NB Freeman	665	21	14
SB Valley	910	70	20
NB Valley	970	20	10
NB SR99	2046	110	44
SB SR99	2068	88	44
NB 54th Ave	1546	22	32
SB 54th Ave	1221	202	178
North Frontage	2156	22	22
SB Frontage	2156	22	22
54th Ave On Ramp to NB I-5	910	60	30
NB I-5	2305	152	76
SB I-5	2093	213	228
NB I-5 HOV	2381	152	0
SB I-5 HOV	2320	213	0
EB Porter Way	882	9	9
WB Porter Way	882	9	9
SB SR167 Outside1	1674	90	36
NB SR167 Outside1	1656	90	54

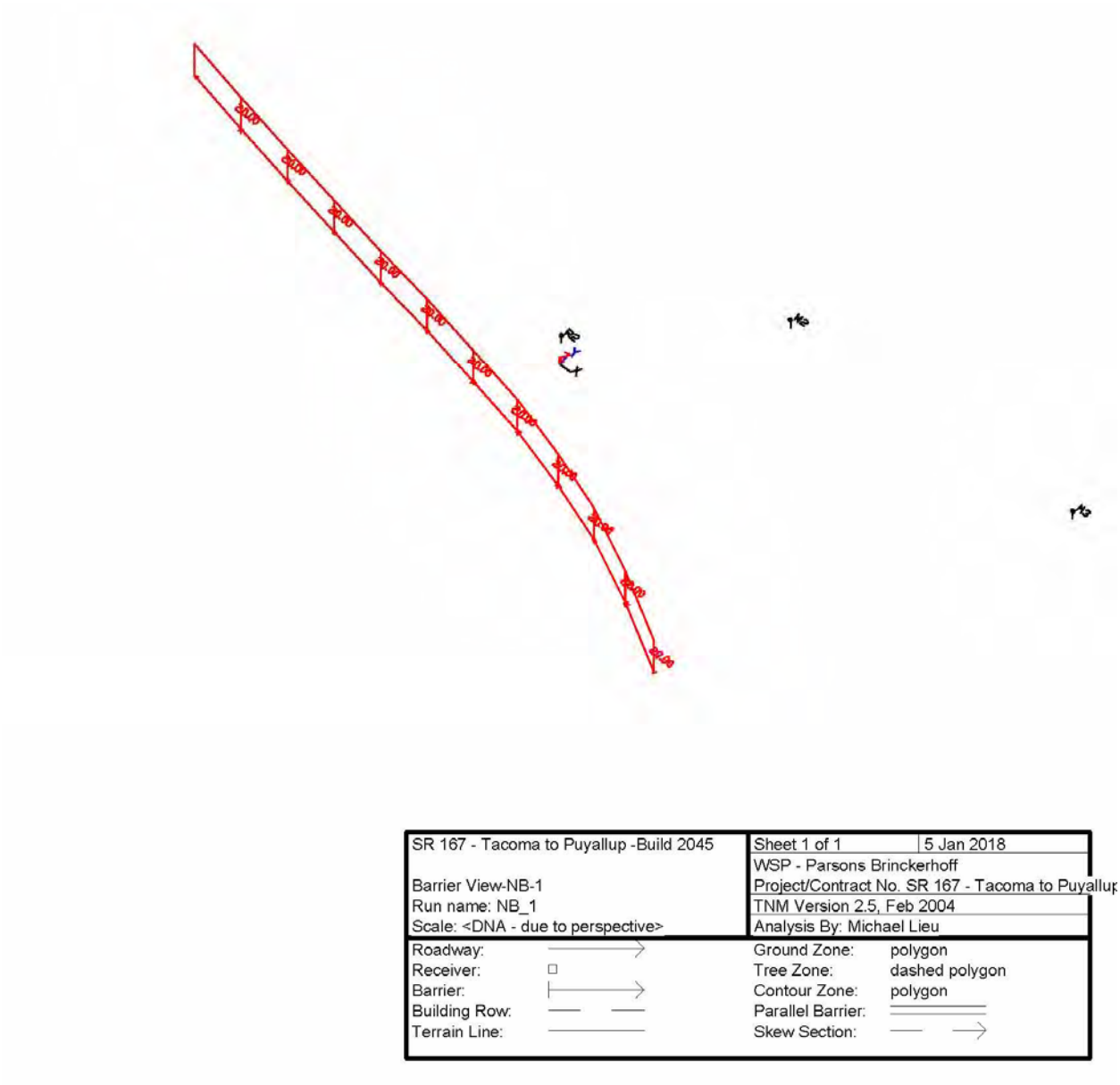
2045 No Build Traffic Data

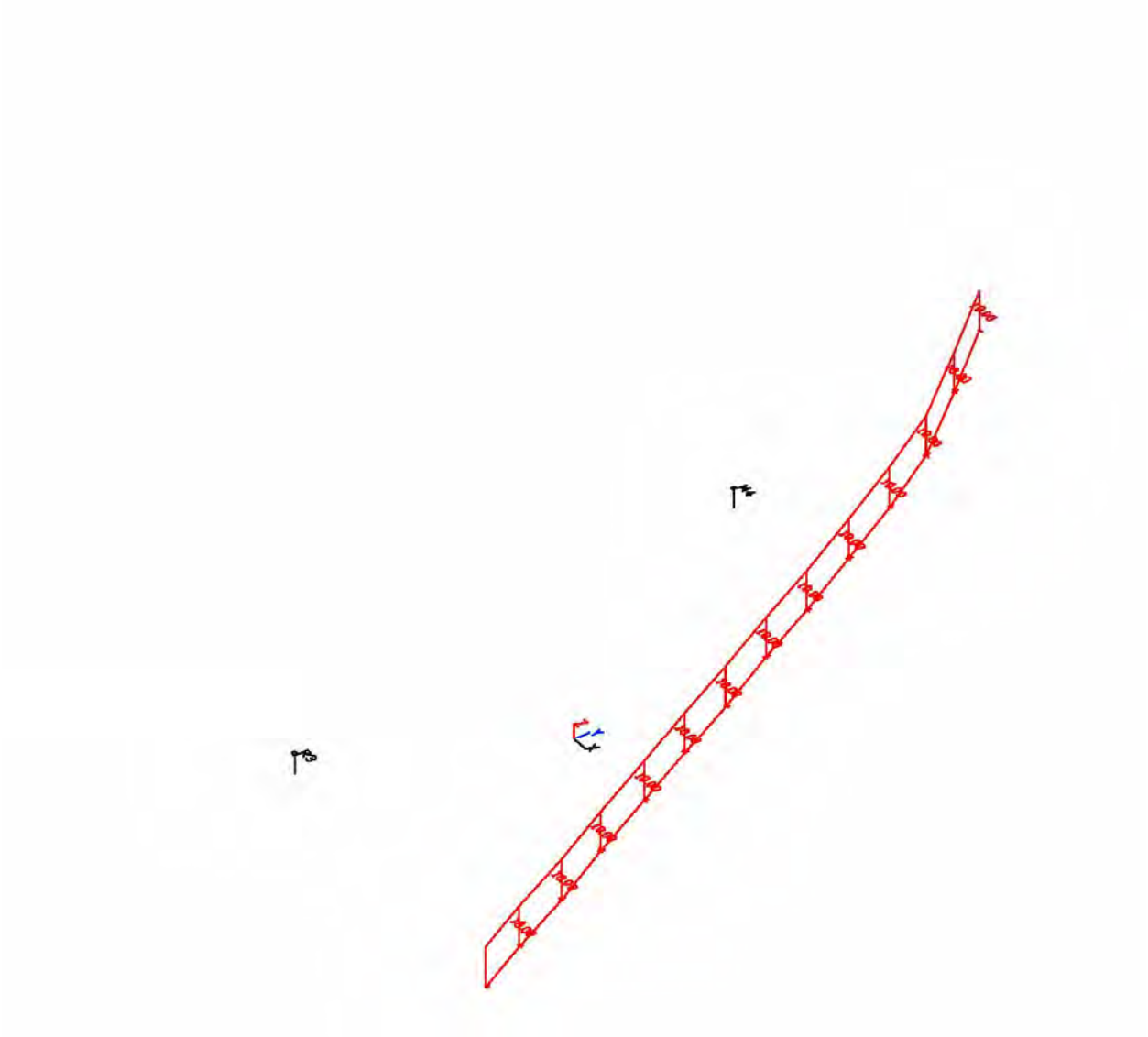
Roadway	Cars Per Lane	Medium Trucks Per Lane	Heavy Trucks per Lane
SB - ValleyAve to N Levee Rd	855	27	18
NB - ValleyAve to N Levee Rd	855	27	18
SB Freeman	665	21	14
NB Freeman	665	21	14
SB Valley	910	70	20
NB Valley	970	20	10
NB SR99	2046	110	44
SB SR99	2068	88	44
NB 54th Ave	1546	22	32
SB 54th Ave	1221	202	178
North Frontage	2156	22	22
SB Frontage	2156	22	22
54th Ave On Ramp to NB I-5	910	60	30
NB I-5	2305	152	76
SB I-5	2093	213	228
NB I-5 HOV	2381	152	0
SB I-5 HOV	2320	213	0
EB Porter Way	882	9	9
WB Porter Way	882	9	9
SB SR167 Outside1	2232	120	48
NB SR167 Outside1	2208	120	72

2045 Build Traffic Data

Roadway	Cars Per Lane	Medium Trucks Per Lane	Heavy Trucks per Lane
SBSR167	1116	36	48
SB Inside SBSR167	1116	36	48
SBSR167 Hov	1164	36	0
NBSR167	1096	60	44
NB Inside SBSR167	1096	60	44
NBSR167 Hov	1140	60	0
SB - ValleyAve to N Levee Rd	855	27	18
NB - ValleyAve to N Levee Rd	855	27	18
SB SR167 to SR161	950	30	20
NB SR161 to SR167	950	30	20
SB Freeman	665	21	14
NB Freeman	665	21	14
SB Valley	1900	60	40
NB Valley	1900	60	40
NB SR167 On ramp from Valley	950	30	20
SB SR167 Off to Valley	317	10	7
NB I-5 to SB SR 167 Ramp	930	30	40
SB SR167 Ramp to NB I-5	930	50	20
NB SR167 Ramp to SB I-5	920	50	30
NB SR167 Middle Aux to I-5	910	60	30
NB 70th Street	823	50	27
SB 70th Street	823	50	27
NB SR99	2011	123	66
SB SR99	1814	173	213
SB I-5 to NB SR167	920	50	30
SB SR167 Outside1	1674	90	36
NB SR167 Outside1	1656	90	54
NB SR167 OffRamp to Ave54	920	50	30
54th Ave to SB SR167 Spur	465	25	10
SB SR167 - Sect SR509 to Ave54	3348	180	72
NB SR167 Inside Ave54 to SR509	3312	180	108
NB 54th Ave	1568	16	16
SB 54th Ave	1568	16	16
North Frontage	2548	26	26
SB Frontage	2548	26	26
54th Ave On Ramp to NB I-5	914	56	30
SB I-5	2315	142	76
NB I-5	2088	199	246
NB I-5 HOV	2391	142	0
SB I-5 HOV	2334	199	0
EB Porter Way	882	9	9
WB Porter Way	882	9	9

Appendix C— TNM Barrier Graphics





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Terrain Line:		Skew Section:	

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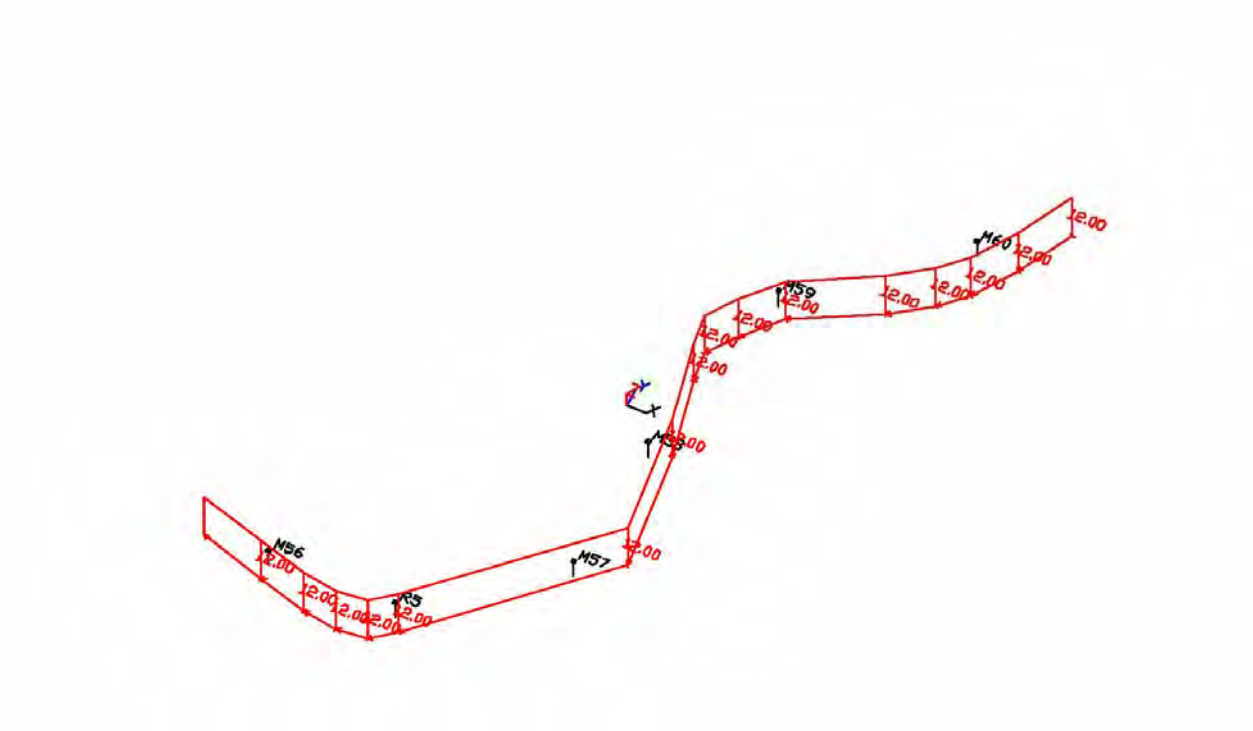

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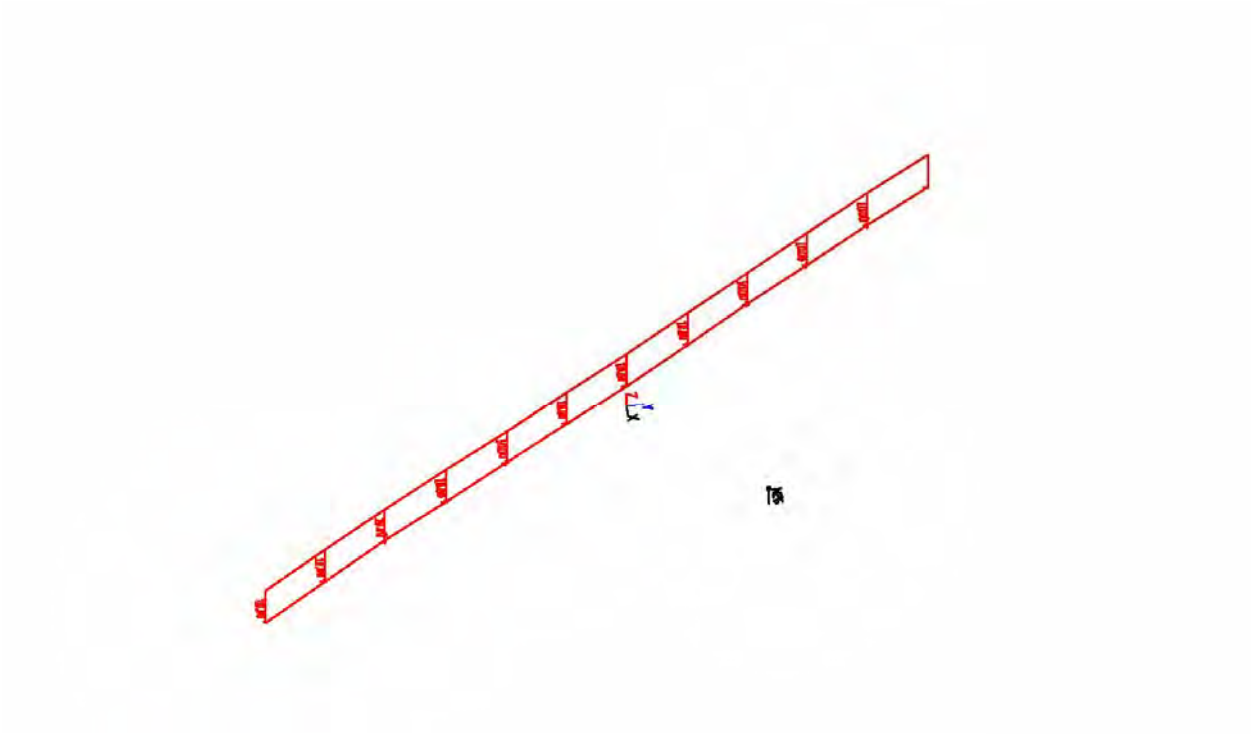

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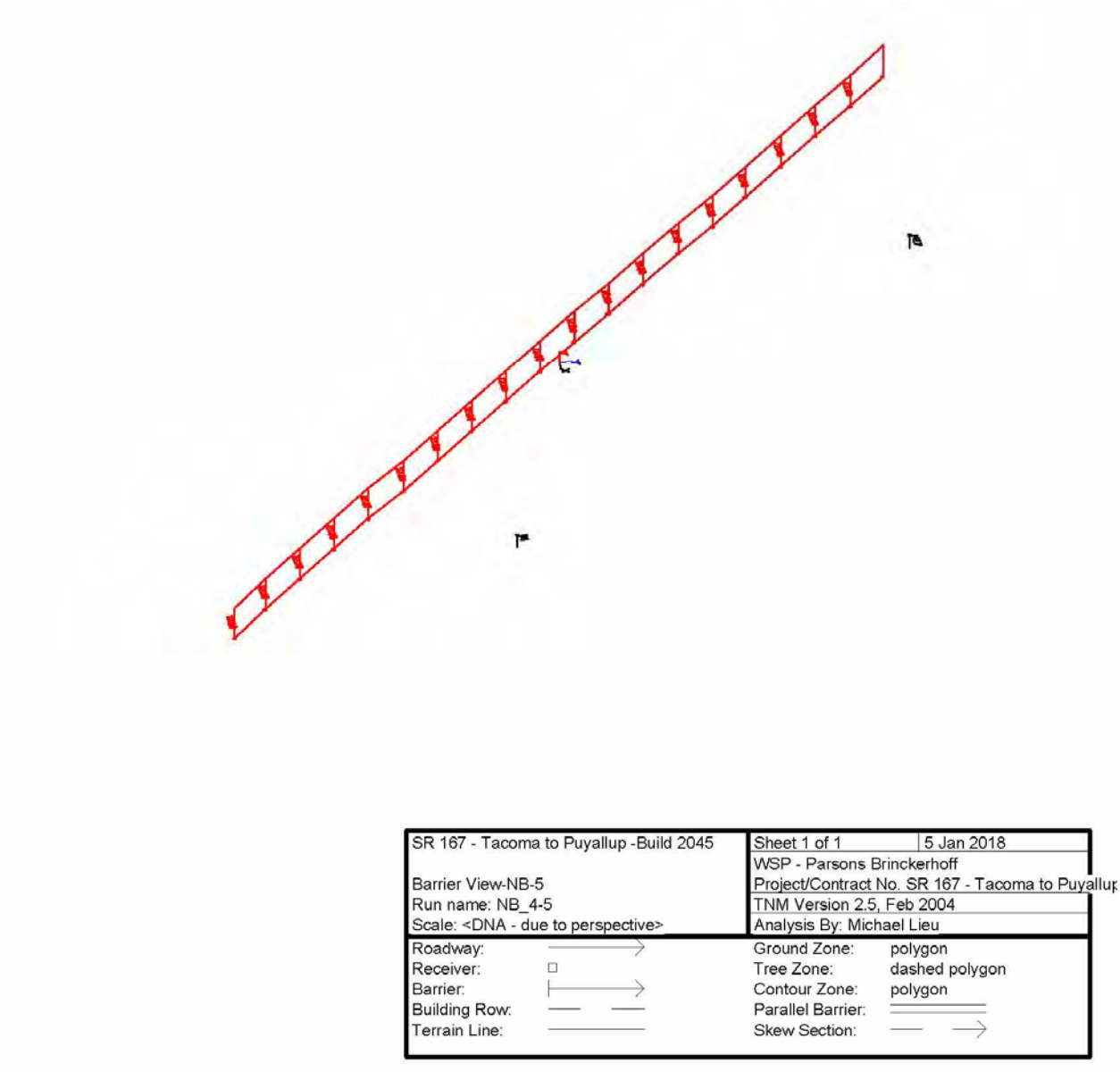

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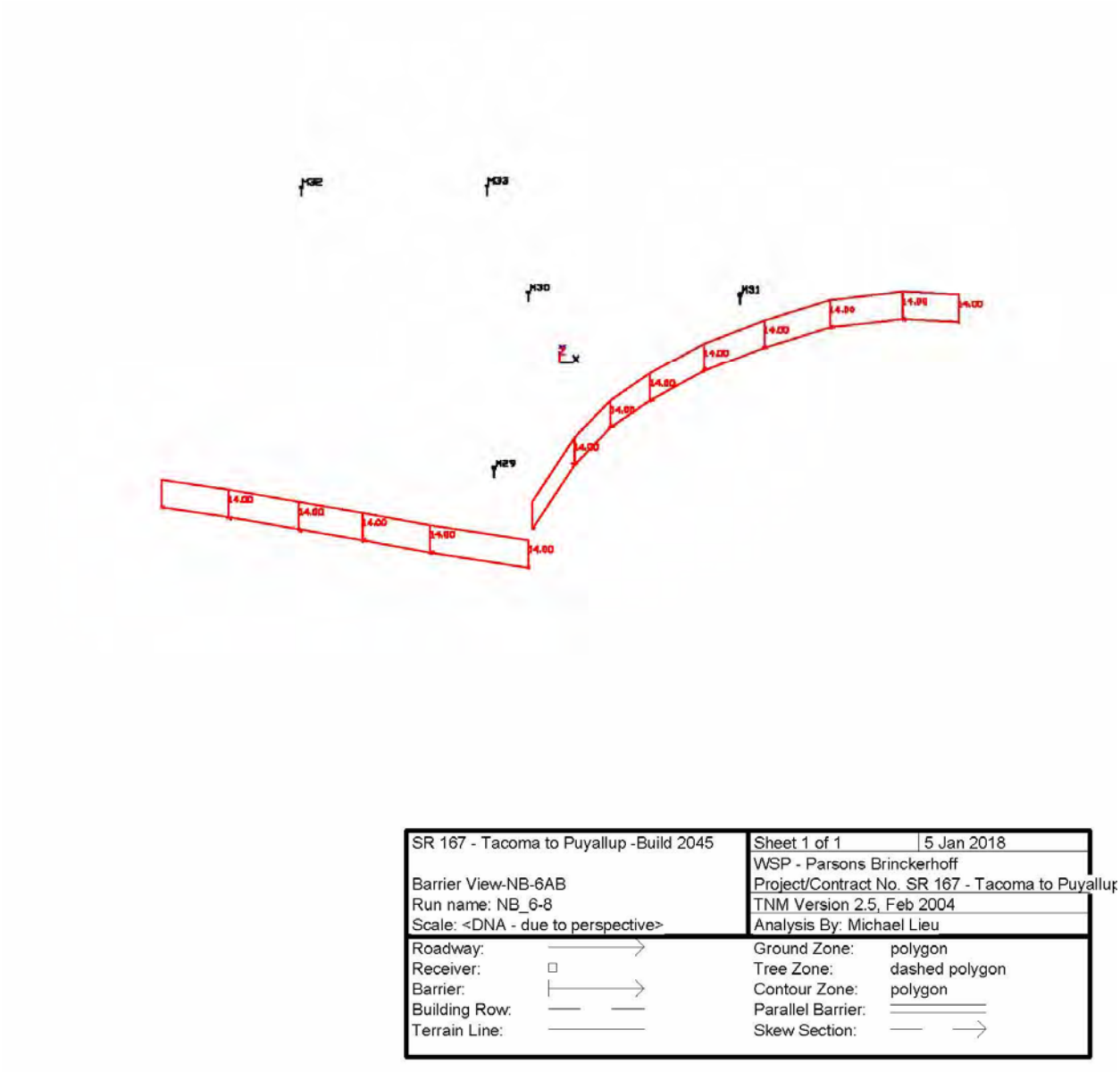

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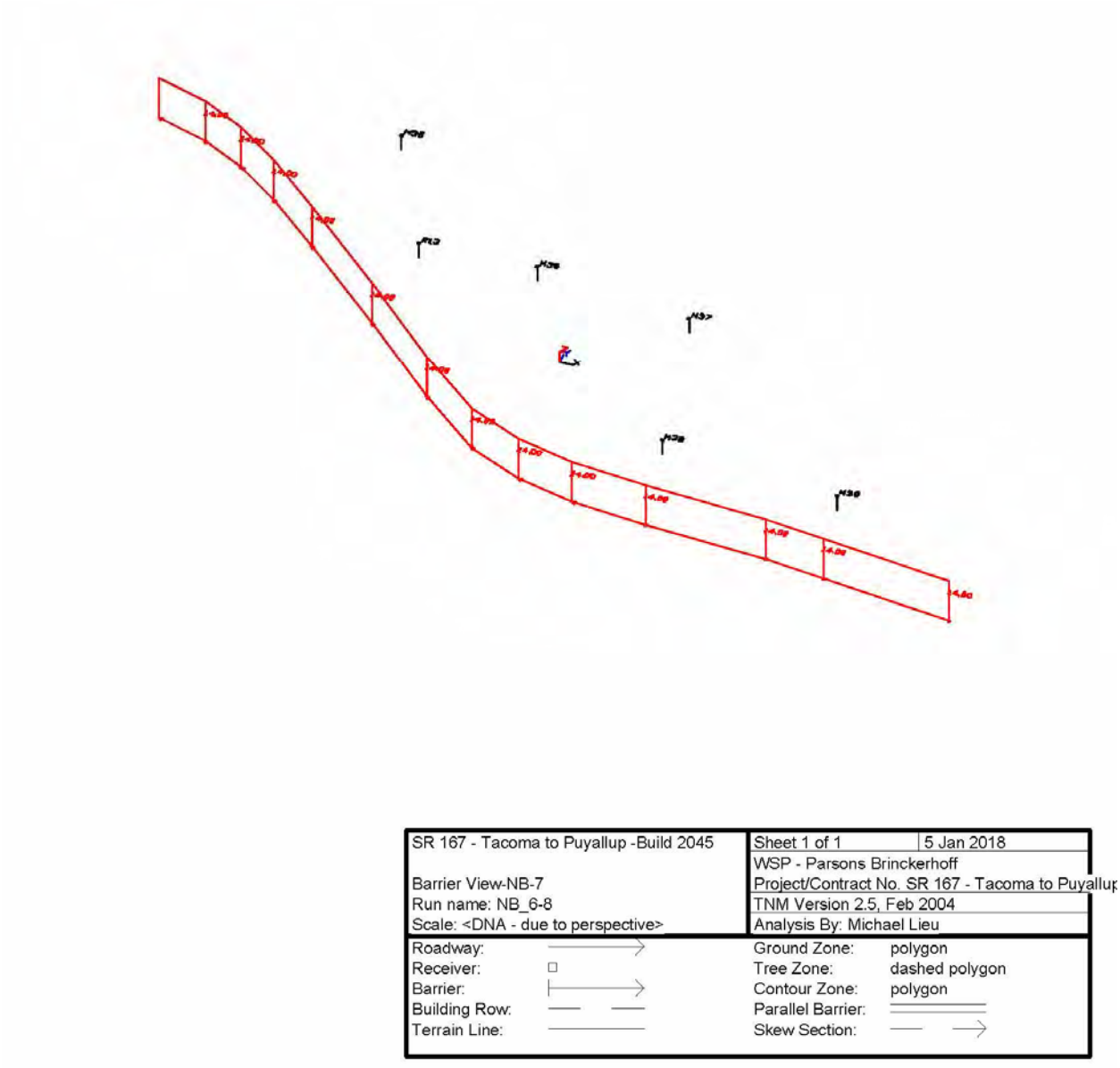

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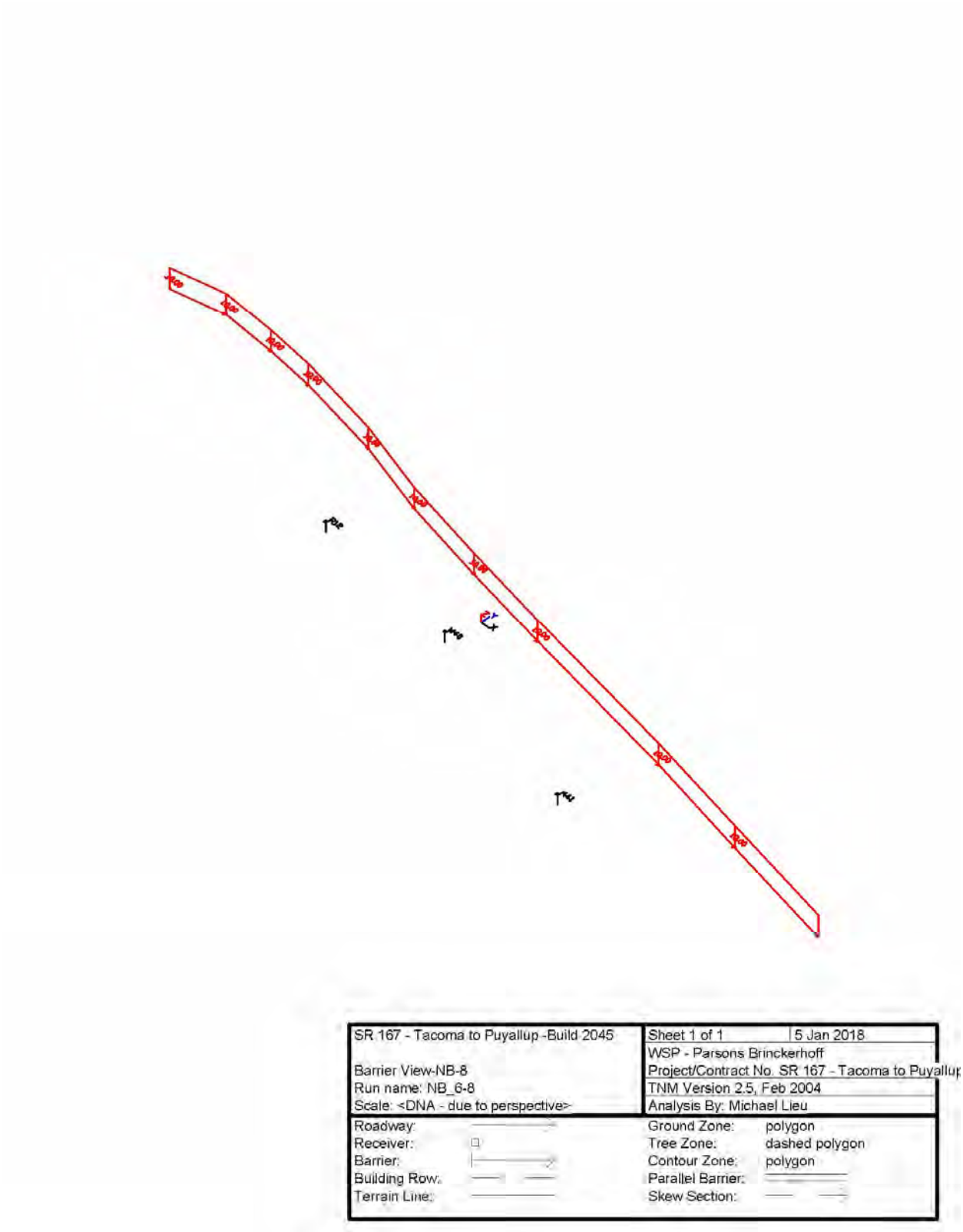
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Receiver:
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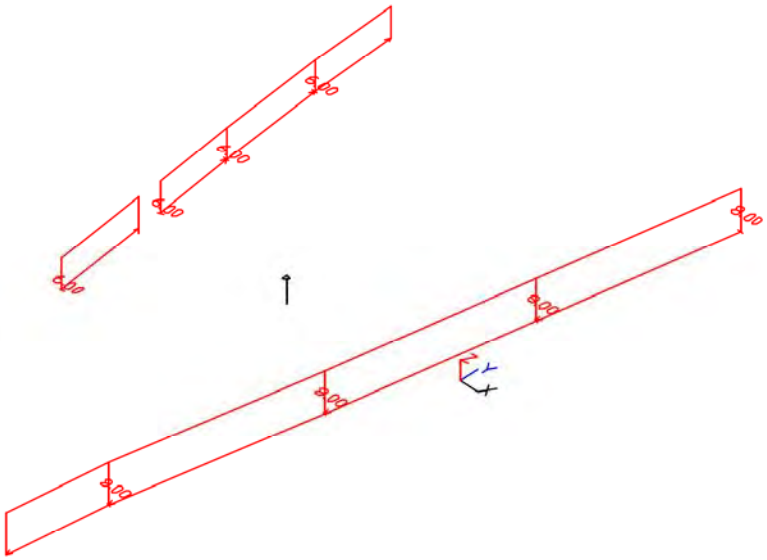
Skew Section:

1
2
3



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	WSP - Parsons Brinckerhoff
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Terrain Line:	Skew Section:

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Appendix D— TNM Data

TNM v2.5 files of all noise modeling files are provided electronically with the Final Noise technical memorandum. Modeling files developed for this report are as follows:

- SR167_Validation1
- SR167_Validation2
- SR167_Validation3
- SR167_Existing
- SR167_NoBuild_DesignYear
- SR167_ProjectBuild_DesignYear
- SR167_Barrier_1
- SR167_Barrier_2
- SR167_Barrier_3
- SR167_Barrier_4
- SR167_Barrier_5
- SR167_Barrier_6
- SR167_Barrier_7
- SR167_Barrier_8
- SR167_Barrier_9

Appendix E – Field Data Sheets

Appendix E contains data sheets from the field that describe the locations where noise measurements were taken on July 14, 21, and 22, 2015, September 2 and 3, 2015, and November 10, 2015.

15-Minute Validation Measurement R1—Puyallup Recreation Center—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

Project Name: SR167 Extension Job #

ID

SITE IDENTIFICATION: 1 OBSERVER(s): Romero / Alcalde
START DATE & TIME: 12:39 pm END DATE & TIME: 12:54
ADDRESS: Puyallup Recreation Center
GPS coordinates:

Weather

TEMP: 74 °F HUMIDITY: 60 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 12 MPH DIR: N NE E SE S SW W NW STEADY GUSTY 0-5 MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

Acoustic Measurements

INSTRUMENT: LD 820 TYPE: 02 SERIAL #: 1194
CALIBRATOR: CAL 200 SERIAL #: 116 86
CALIBRATION CHECK: PRE-TEST 114 dBA SPL POST-TEST 114 dBA SPL WINDSCREEN Y
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time	End Time	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	
1	12:39	12:54	49.1	63.2	43.6	44.7	46.5	50.7	59.3

COMMENTS:

Source Info and Traffic Counts

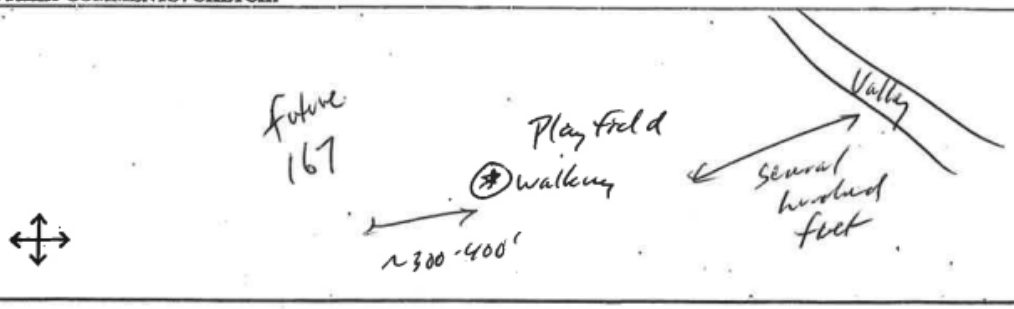
PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: No autos, too far
COUNT DURATION: -MINUTE SPEED (mph) #2 COUNT: SPEED (mph)

	NB / EB / SB / WB	NB EB / SB WB	NB / EB / SB / WB	NB EB / SB WB
AUTOS:	/ / /	/ /	/ / /	/ /
MED. TRUCKS:	/ / /	/ /	/ / /	/ /
HVY TRUCKS:	/ NO / Count	/ /	/ / /	/ /
BUSES:	/ / /	/ /	/ / /	/ /
MOTORCYCLES:	/ / /	/ /	/ / /	/ /

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER
OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS with horns.
OTHER:

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: Digital
OTHER COMMENTS / SKETCH:



15-Minute & 24-Hour Measurement R2—Residence at 502 56th Avenue East—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 Extension Job #

SITE IDENTIFICATION: 2 OBSERVER(s): Romero / Lalenek
START DATE & TIME: 11: END DATE & TIME:
ADDRESS: 502 56th Ave E, Fife
Cassandra McGary 360.970.9289
GPS coordinates:

TEMP: 74 °F HUMIDITY: 60 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 25 mph MPH DIR: N NE E SE S SW W NW STEADY GUSTY ____MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

INSTRUMENT: LD-820 TYPE: 1 2 SERIAL #: 1194
CALIBRATOR: CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN ✓
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time / End Time							
2	11:45 noon	L_{eq} 49.5	L_{max} 68.1	L_{min} 41.9	L_{90} 43.1	L_{50} 44.8	L_{10} 50.7	Serial #
2	24/ 11:40 /	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	
	/ /	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	

COMMENTS: 2-24, 24 hr measurement with LD 712 Serial # 02'18, Type 2. After ~30 min Leq 55 dBA

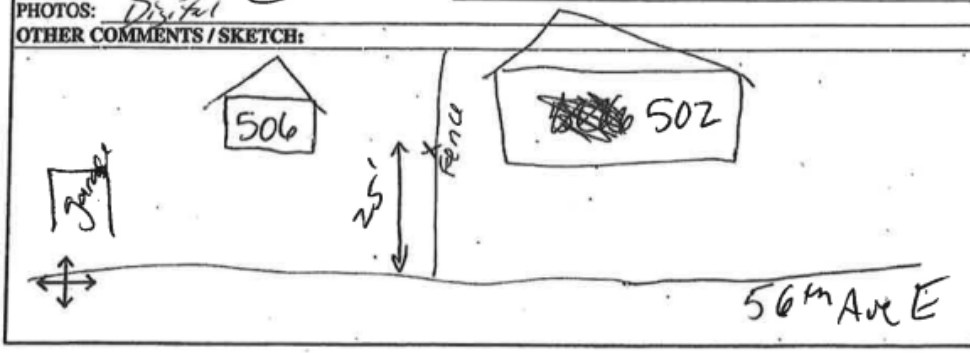
PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: Side street

COUNT DURATION: ____-MINUTE	NB / EB / SB / WB	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	____ / ____	Separate	____ / ____	____ / ____
MED. TRUCKS:	____ / ____		____ / ____	____ / ____
HVY TRUCKS:	____ / ____	____ / ____	____ / ____	____ / ____
BUSES:	____ / ____	____ / ____	____ / ____	____ / ____
MOTORCYCLES:	____ / ____	____ / ____	____ / ____	____ / ____

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: Industrial complex nearby, manlift horn, truck moving

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: Digital
OTHER COMMENTS / SKETCH:



15-Minute & 24-Hour Measurement R3—Residence at 5923 10th Street—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

Project Name: SR 167 Extension Job #

SITE IDENTIFICATION: 3 OBSERVER(s): LALONDE / Romero
START DATE & TIME: July 21 '15 END DATE & TIME:
ADDRESS: Across / from 5923 10th St CtE
Vacant lot
GPS coordinates:

ID

TEMP: 74 °F HUMIDITY: 60 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: <3 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ____MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

Weather

INSTRUMENT: LD 820 TYPE: (1) 2 SERIAL #: 1194
CALIBRATOR: CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114 dBA SPL POST-TEST 114 dBA SPL WINDSCREEN: Yes
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time / End Time								
3	1:10pm / 1:25	L_{eq} 47.6	L_{max} 63.6	L_{min} 44.2	L_{90} 45.5	L_{50} 46.8	L_{10} 49.1	L_1 52.6	
24	1:15pm /	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		
/	/	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		
/	/	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		

COMMENTS: 3-24, 24 hr measurement with LD 720 Serial # 0524, Type 2.

Acoustic Measurements

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: Side street

COUNT DURATION: ____-MINUTE

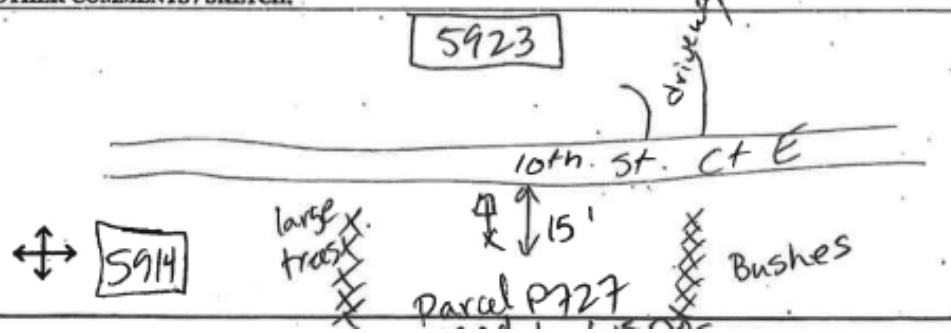
	COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	____ / ____ / ____ / ____	Separate	____ / ____ / ____ / ____	____ / ____
MED. TRUCKS:	____ / ____ / ____ / ____		____ / ____ / ____ / ____	____ / ____
HVY TRUCKS:	____ / ____ / ____ / ____		____ / ____ / ____ / ____	____ / ____
BUSES:	____ / ____ / ____ / ____		____ / ____ / ____ / ____	____ / ____
MOTORCYCLES:	____ / ____ / ____ / ____		____ / ____ / ____ / ____	____ / ____

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: light industrial area, various machinery distant

Source Info and Traffic Counts

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: Digital
OTHER COMMENTS / SKETCH:



Description / Sketch

15-Minute & 24-Hour Measurement R4—Residence at 6320 9th Street East—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR167 Extension Job #

ID

SITE IDENTIFICATION: 4 OBSERVER(s): Lalonde / Romero
START DATE & TIME: 7/21/15 2:40 END DATE & TIME:
ADDRESS: 6320 9th St. E Fife / Tacoma
GPS coordinates:

Weather

TEMP: 70 °F HUMIDITY: 30 % R.H. WIND: CALM (LIGHT) MODERATE VARIABLE
WINDSPEED: 0-2 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ___ MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY (OVRCST) FOG DRIZZLE RAIN Other:

Acoustic Measurements

INSTRUMENT: LD820 TYPE: (1) 2 SERIAL #: 1194
CALIBRATOR: CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114 dBA SPL POST-TEST 114 dBA SPL WINDSCREEN ✓
SETTINGS: (A-WEIGHTED) SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time / End Time	
4	2:40PM / 2:55p	L_{eq} 56.4, L_{max} 61.8, L_{min} 54.0, L_{90} 55.1, L_{50} 56.3, L_{10} 57.4, (1) 58.9
4-24hr	2:42PM / 3:19	L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___
___	___ / ___	L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___
___	___ / ___	L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___

COMMENTS: 4-24hr

Source Info and Traffic Counts

PRIMARY NOISE(S): (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER high freq tonal noises in distance
ROADWAY TYPE: distant freeway noise, limited aircraft & machinery noise

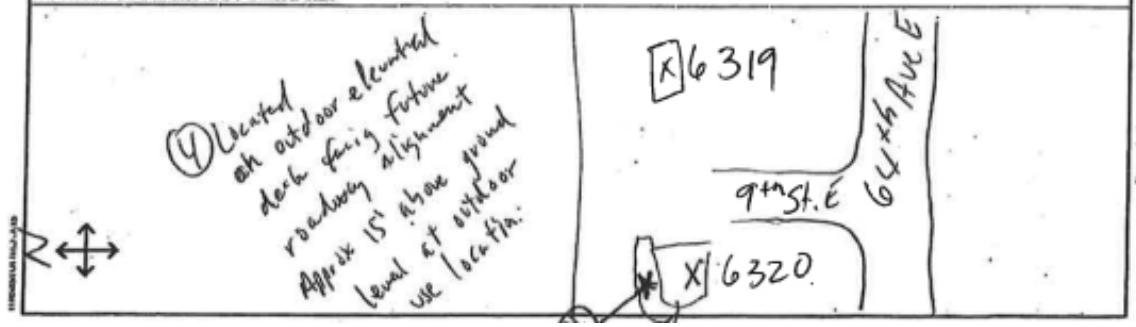
COUNT DURATION: ___-MINUTE	NB / EB / SB / WB	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	~~Ave~~ toonts	___ / ___	___ / ___	___ / ___
MED. TRUCKS:	~~Ave~~ two	___ / ___	___ / ___	___ / ___
HVY TRUCKS:	~~Ave~~ two	___ / ___	___ / ___	___ / ___
BUSES:	___ / ___	___ / ___	___ / ___	___ / ___
MOTORCYCLES:	___ / ___	___ / ___	___ / ___	___ / ___

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

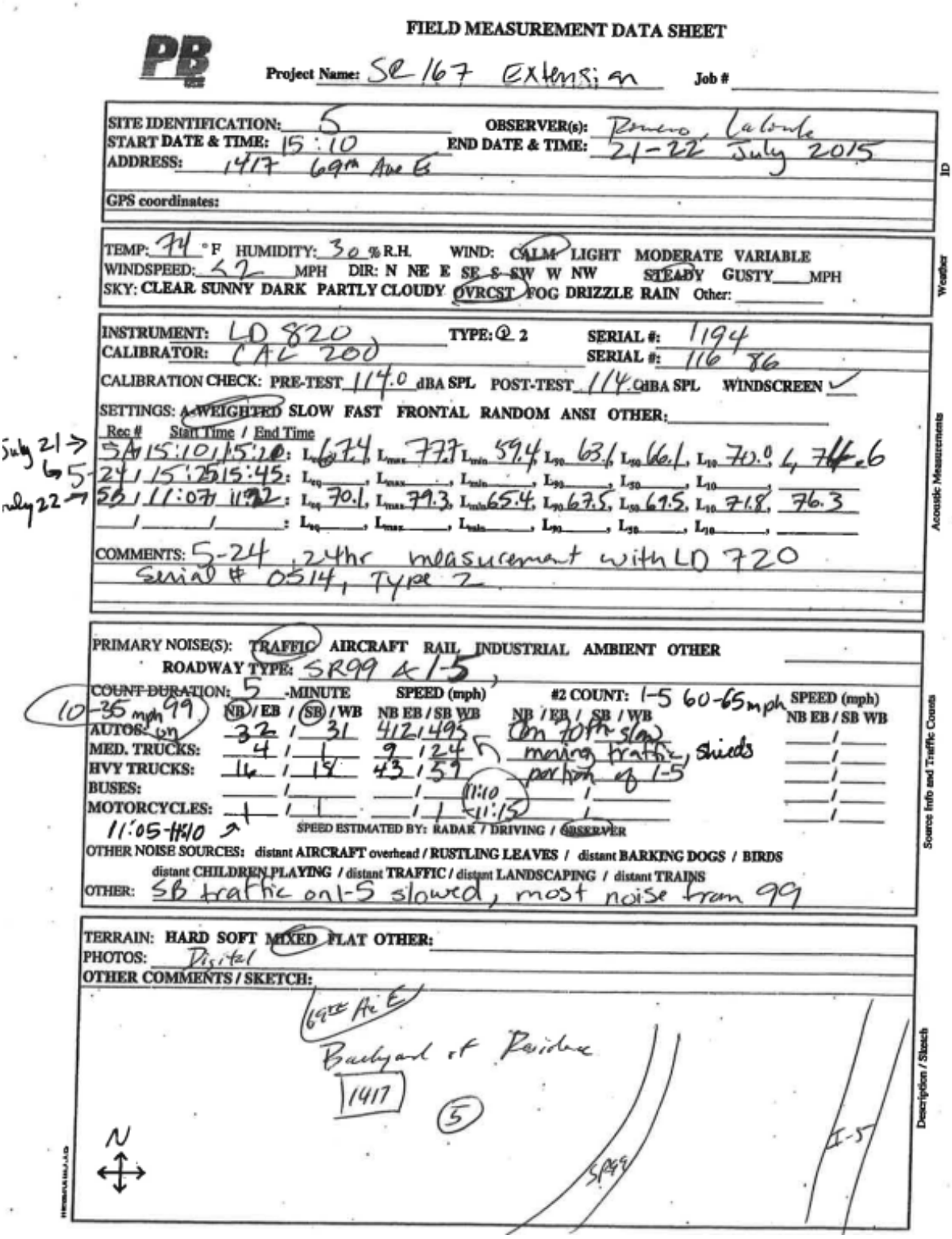
OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / (BIRDS) distant
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER:

Descriptive / Sketch

TERRAIN: HARD SOFT (MIXED) FLAT OTHER:
PHOTOS: digital
OTHER COMMENTS / SKETCH:



15-Minute Validation Measurement R5—Residence at 1417 69th Ave East—Field Data Sheet



FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 Extension Job #

SITE IDENTIFICATION: 5 OBSERVER(s): Romero, LaBonte
START DATE & TIME: 15:10 END DATE & TIME: 21-22 July 2015
ADDRESS: 1417 69th Ave E
GPS coordinates:

TEMP: 74 °F HUMIDITY: 30 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 2-7 MPH DIR: N NE E SE S SW W NW STEADY GUSTY MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

INSTRUMENT: LD 820 TYPE: 2 SERIAL #: 1194
CALIBRATOR: CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN ✓
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

	Rec #	Start Time / End Time								
July 21 →	SA	15:10 / 15:20	L_{eq} 67.4	L_{max} 77.7	L_{min} 59.4	L_{90} 63.1	L_{50} 66.1	L_{10} 70.0	4 7646	
to 5-	24	15:25 / 15:45	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		
July 22 →	5B	11:07 / 11:22	L_{eq} 70.1	L_{max} 79.3	L_{min} 65.4	L_{90} 67.5	L_{50} 69.5	L_{10} 71.8	76.3	
	/	/	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		

COMMENTS: 5-24, 24hr measurement with LD 720 Serial # 0514, Type 2

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: SR99 & I-5,
COUNT DURATION: 5 -MINUTE SPEED (mph) #2 COUNT: I-5 60-65 mph SPEED (mph)

	NB / EB	SB / WB	NB EB / SB WB	NB / EB / SB / WB	NB EB / SB WB
10-35 mph 99 AUTOS: by	32	31	412 / 493	(on 10th slow)	/
MED. TRUCKS:	4	1	9 / 24	moving traffic, shields	/
HVY TRUCKS:	16	19	43 / 59	portion of I-5	/
BUSES:			/	11:10	/
MOTORCYCLES:	1	1	1 / 1	11:15	/
11:05-11:10 ↗			SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER		

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: SB traffic on I-5 slowed, most noise from 99

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: Digital
OTHER COMMENTS / SKETCH:

ID | Weather | Acoustic Measurements | Source Info and Traffic Counts | Description / Sketch

1 **15-Minute Validation Measurement R6—Apartments at 6643 20th St East—Field Data Sheet**

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 East Job #

SITE IDENTIFICATION: 6 OBSERVER(s): LALONDE / Romero
START DATE & TIME: 7/21-22 12:30 END DATE & TIME: 12:45 7/21-22
ADDRESS: 6643 20th St East, Fife
Contact: Rainier Pointe Apartment Homes. Cindy Johnson 253.922.1908
GPS coordinates:

ID

TEMP: 74 °F HUMIDITY: 30 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 1-2 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ___MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

Weather

INSTRUMENT: LD 820 TYPE: 1 2 SERIAL #: 1194
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Y
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Acoustic Measurements

	Rec #	Start Time / End Time							
7/22/15	6	7/24 / 12:24 / 12:39	L_{eq} 61.4	L_{max} 66.3	L_{min} 56.1	L_{50} 59.0	L_{20} 61.2	L_{10} 63.0	
7/23/15	6-1	7/24 / 12:25 / 12:25	L_{eq} ___	L_{max} ___	L_{min} ___	L_{50} ___	L_{20} ___	L_{10} ___	
		___/___/___ :	L_{eq} ___	L_{max} ___	L_{min} ___	L_{50} ___	L_{20} ___	L_{10} ___	
		___/___/___ :	L_{eq} ___	L_{max} ___	L_{min} ___	L_{50} ___	L_{20} ___	L_{10} ___	

COMMENTS:
on I-5 good size safety Barrier ~4 feet

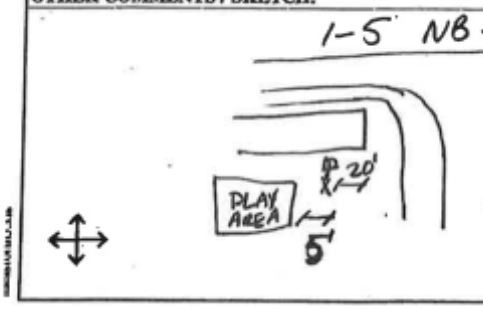
PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: I-5 SB NB
COUNT DURATION: 5 -MINUTE SPEED (mph) 65 #2 COUNT: SPEED (mph)

	NB / EB / SB / WB	NB EB / SB WB	NB / EB / SB / WB	NB EB / SB WB
AUTOS:	43 / 421	___/___	second count @ row	___/___
MED. TRUCKS:	7 / 12	___/___	___/___	___/___
HVY TRUCKS:	31 / 49	___/___	___/___	___/___
BUSES:	___/___	___/___	___/___	___/___
MOTORCYCLES:	___/___	___/___	___/___	___/___

5min
SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER
OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER:

Source Info and Traffic Counts

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: Dig Yes
OTHER COMMENTS / SKETCH:



Description / Sketch

2
3

15-Minute Validation Measurement R7—Residence at 5307 4th Street—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 Extension Job #: 1602505-AC

ID

SITE IDENTIFICATION: 7 OBSERVER(s): Romero, Maurer
START DATE & TIME: 9/2/15 10:13 END DATE & TIME: 9/2/15 10:28
ADDRESS: 5307 Street

GPS coordinates:

Weather

TEMP: 66 °F HUMIDITY: 55 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-4 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ___ MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other: ___

Acoustic Measurements

INSTRUMENT: LD 820 TYPE: 1 2 SERIAL #: 1313
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN ✓
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ___

Rec #	Start Time / End Time	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}	
7	10:13 / 10:28	53.8	67.5	49.9	51.5	52.0	55.5	4(1) 59.8
7-24	10:18 / →							
	/							
	/							

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: 54 AVE - no traffic on 4TH
COUNT DURATION: 10 -MINUTE

	NB / EB / SB / WB	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	213 + total	50-55	/	/
MED. TRUCKS:	42 + total	/	1 sides street car	/
HVY TRUCKS:	55 + total	/	/	/
BUSES:	/	/	/	/
MOTORCYCLES:	/	/	/	/

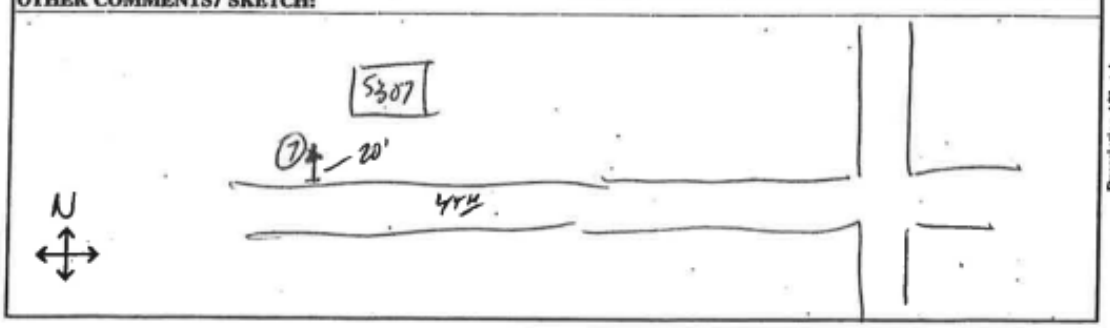
Combined directions equal traffic

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: Nearby Heavy Truck Parking / Loading

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER: ___
PHOTOS: digital
OTHER COMMENTS / SKETCH:



15-Minute Validation Measurement R8—Residence at 74th & Valley Road—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

Project Name: SR 167 Job #: 160505-AC

ID

SITE IDENTIFICATION: 8 OBSERVER(s): Romero, Maurer
START DATE & TIME: 9-2-15 11:02A END DATE & TIME: 9-2-15 11:20A
ADDRESS: JUST EAST of 74TH AVE IN VALLEY RD.
GPS coordinates:

Weather

TEMP: 67 °F HUMIDITY: 50 % R.H. WIND: CALM (LIGHT) MODERATE VARIABLE
WINDSPEED: 0-4 MPH DIR: (N) NE E SE S SW W NW STEADY GUSTY ____MPH
SKY: CLEAR (SUNNY) DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

Acoustic Measurements

INSTRUMENT: LD 820 TYPE: (1) 2 SERIAL #: 1313
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Yes
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time / End Time								
8	11:02 / 11:17	L_{eq} 62.4	L_{max} 73.7	L_{min} 45.9	L_{90} 51.1	L_{50} 60.0	L_{10} 66.0	L_1 71.3	
8-24	11:05→	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		
/	/	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		
/	/	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}		

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE:
COUNT DURATION: 10 -MINUTE

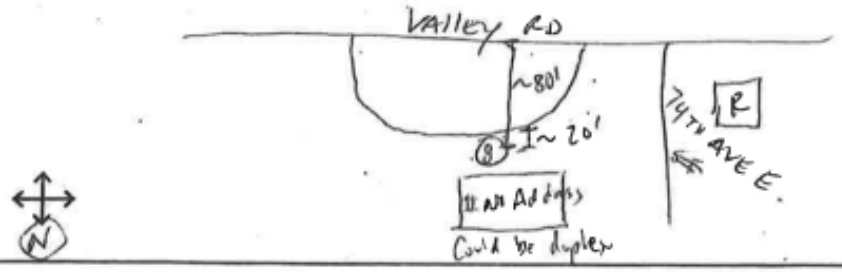
	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	47 / 48		
MED. TRUCKS:	6 / 5		
HVY TRUCKS:	11 / 4		
BUSES:			
MOTORCYCLES:			

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER:

Description / Sketch

TERRAIN: HARD SOFT (MIXED) FLAT OTHER:
PHOTOS: Digital
OTHER COMMENTS / SKETCH:



1 **15-Minute & 24-Hour Measurement R9—Residence at 4525 Freeman Rd E—Field Data Sheet**

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 Job # 160505-AC

ID

SITE IDENTIFICATION: 9 OBSERVER(s): Romo, Mauer
START DATE & TIME: 9-2-15 11:47A END DATE & TIME: 9-2-15
ADDRESS: 4525 FREEMAN RD E
GPS coordinates:

Weather

TEMP: 68 °F HUMIDITY: 50 % R.H. WIND: (CALM) LIGHT MODERATE VARIABLE
WINDSPEED: 0-2 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ____MPH
SKY: CLEAR (SUNNY) DARK PARTLY (CLOUDY) OVRCST FOG DRIZZLE RAIN Other: ____

Acoustic Measurements

INSTRUMENT: ~~LD~~ LD820 TYPE: (1) 2 SERIAL #: 1313
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Y
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ____

Rec #	Start Time / End Time	
9	11:48 / 12:02	L_{eq} 52.8, L_{max} 67.2, L_{min} 43.8, L_{90} 45.8, L_{50} 49.1, L_{10} 56.3, 4, 62.5
9-24	11:50 / ____	L_{eq} ____, L_{max} ____, L_{min} ____, L_{90} ____, L_{50} ____, L_{10} ____, ____
____	____ / ____	L_{eq} ____, L_{max} ____, L_{min} ____, L_{90} ____, L_{50} ____, L_{10} ____, ____
____	____ / ____	L_{eq} ____, L_{max} ____, L_{min} ____, L_{90} ____, L_{50} ____, L_{10} ____, ____

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC (AIRCRAFT) (RAIL) INDUSTRIAL AMBIENT OTHER ____
ROADWAY TYPE: FREEMAN RD E.

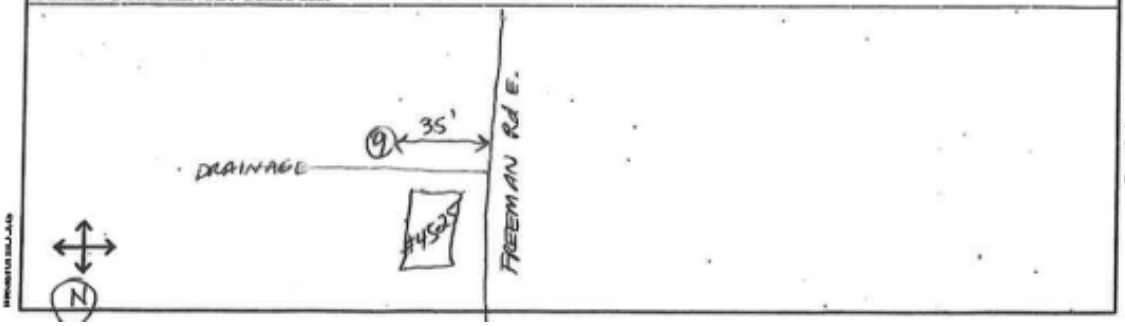
COUNT DURATION: 10 -MINUTE	~~NB / EB / SB / WB~~	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) ~~NB EB / SB WB~~
AUTOS:	10 */____	____/____	____/____	35 / 35
MED. TRUCKS:	2 */____	____/____	____/____	____/____
HVY TRUCKS:	____/____	____/____	____/____	____/____
BUSES:	____/____	____/____	____/____	____/____
MOTORCYCLES:	____/____	____/____	____/____	____/____

*COMBINED TRAFFIC SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: ____

Description / Sketch

TERRAIN: HARD SOFT (MIXED) FLAT OTHER: ____
PHOTOS: Digital
OTHER COMMENTS / SKETCH:



2
3

15-Minute Measurement R10—Residence at 5822 108th Ave Ct E—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

PB

Project Name: 167 Extension Job # 160250S-AC

ID

SITE IDENTIFICATION: R10 OBSERVER(s): Romero, Mauer
START DATE & TIME: 11/10/15 10:20 END DATE & TIME: 11/10/15 10:35
ADDRESS: 5822 108th Ave Ct E
GPS coordinates:

Weather

TEMP: 47 °F HUMIDITY: 53 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 1-3 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ___MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other: ___

Acoustic Measurements

INSTRUMENT: LDXT TYPE: 1 2 SERIAL #: 3981
CALIBRATOR: LDCAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Y
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ___

Rec #	Start Time / End Time							
101	10:20 / 10:35:	L_{eq} 63.6,	L_{max} 78.9,	L_{min} 53.9,	L_{90} 58.1,	L_{50} 61.7,	L_{10} 66.2,	(1) 70.7
___	___ / ___:	L_{eq} ___,	L_{max} ___,	L_{min} ___,	L_{90} ___,	L_{50} ___,	L_{10} ___,	___
___	___ / ___:	L_{eq} ___,	L_{max} ___,	L_{min} ___,	L_{90} ___,	L_{50} ___,	L_{10} ___,	___
___	___ / ___:	L_{eq} ___,	L_{max} ___,	L_{min} ___,	L_{90} ___,	L_{50} ___,	L_{10} ___,	___

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER ___
ROADWAY TYPE: SR167
COUNT DURATION: 10 -MINUTE

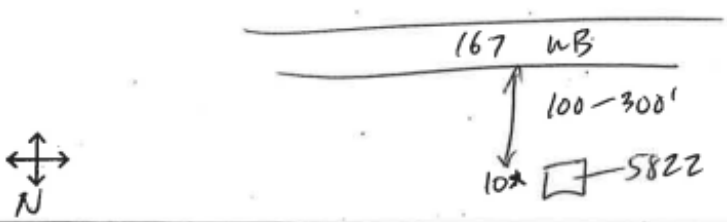
	#1 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	130 / 153	40s 50-55	___ / ___	___ / ___
MED. TRUCKS:	10 / 12	↓ / ↓	___ / ___	___ / ___
HVY TRUCKS:	18 / 17	↓ / ↓	___ / ___	___ / ___
BUSES:	___ / ___	___ / ___	___ / ___	___ / ___
MOTORCYCLES:	___ / ___	___ / ___	___ / ___	___ / ___

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: ___

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER: ___
PHOTOS: Digital
OTHER COMMENTS/ SKETCH:



15-Minute Measurement R11—Residence at 5919 106th Ave Ct E—Field Data Sheet

FIELD MEASUREMENT DATA SHEET

Project Name: 167 EXT Job # 160505-AC

ID

SITE IDENTIFICATION: R11 OBSERVER(s): Romeo, Maurer
START DATE & TIME: 11/10/15 10:50 END DATE & TIME: 11/10/15 11:05
ADDRESS: 5919 106TH AVE CT E
GPS coordinates:

Weather

TEMP: 47 °F HUMIDITY: 60 %R.H. WIND: (CALM) LIGHT MODERATE VARIABLE
WINDSPEED: 0-1 MPH DIR: N NE E SE S SW (W) NW STEADY GUSTY ___ MPH
SKY: CLEAR SUNNY DARK (PARTLY CLOUDY) OVRCST FOG DRIZZLE RAIN Other: ___

Acoustic Measurements

INSTRUMENT: LXT TYPE: (1) 2 SERIAL #: 3981
CALIBRATOR: CO CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Y
SETTINGS: A-(WEIGHTED) SLOW FAST FRONTAL RANDOM ANSI OTHER: ___

Rec #	Start Time / End Time	L_{eq}	L_{max}	L_{min}	L_{99}	L_{50}	L_{10}	
1995	/ /							
R11	10:50 / 11:05	62.4	80.1	48.5	52.3	58.0	63.5	(1) 74.3
	/ /							
	/ /							

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): (TRAFFIC) AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER ___
ROADWAY TYPE: 167
COUNT DURATION: 10 -MINUTE

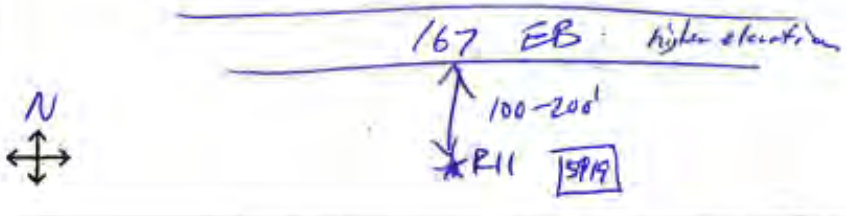
	NB / (EB) / SB / (WB)	SPEED (mph) NB EB / SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
AUTOS:	112 / 140	40-57 50-55	/	/
MED. TRUCKS:	6 / 4	↓ / ↓	/	/
HVY TRUCKS:	20 / 9	↓ / ↓	/	/
BUSES:	/	/	/	/
MOTORCYCLES:	/	/	/	/

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: ___

Description / Sketch

TERRAIN: HARD SOFT (MIXED) FLAT OTHER: ___
PHOTOS: Digital
OTHER COMMENTS/ SKETCH:



1 **15-Minute Measurement R12—Residence at 11714 Houston Rd E—Field Data Sheet**

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR 167 Ext Job # 160505-AC

ID

SITE IDENTIFICATION: R12 OBSERVER(s): Powers, Mauver
START DATE & TIME: 11/10/15 11:30 END DATE & TIME: 11/10/15 11:45
ADDRESS: 11714 Houston Rd E
GPS coordinates:

Weather

TEMP: 45 °F HUMIDITY: 50 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-2 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ____MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other: ____

Acoustic Measurements

INSTRUMENT: LxT TYPE: 1 2 SERIAL #: 3981
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Y
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ____

Rec #	Start Time / End Time								
R12	11:30 / 11:45	L_{eq} 69.3	L_{max} 75.2	L_{min} 58.9	L_{90} 65.5	L_{50} 68.8	L_{10} 71.6	L(1)73.2	
___	___ / ___	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	
___	___ / ___	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	
___	___ / ___	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	

COMMENTS: Aircraft flyovers before, during, after measurement

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER ____
ROADWAY TYPE: SR167
COUNT DURATION: 10 -MINUTE

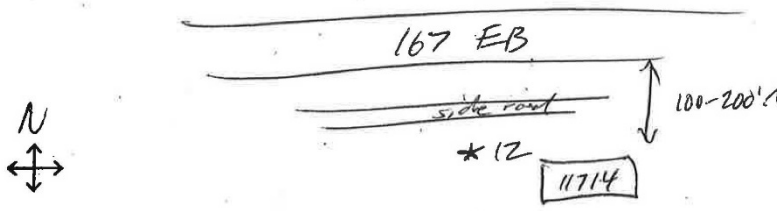
	NB / EB	SB / WB	SPEED (mph) NB EB	SPEED (mph) SB WB	#2 COUNT: NB / EB	#2 COUNT: SB / WB	SPEED (mph) NB EB	SPEED (mph) SB WB
AUTOS:	452	146	55-70	55-60	___	___	___	___
MED. TRUCKS:	2	8	↓	↓	___	___	___	___
HVY TRUCKS:	38	20	↓	↓	___	___	___	___
BUSES:	___	___	___	___	___	___	___	___
MOTORCYCLES:	___	___	___	___	___	___	___	___

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: ____

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER: ____
PHOTOS: digital
OTHER COMMENTS / SKETCH:



505 S. Main Street, Suite 900, Orange, CA 92868, 714-835-6886

2

1 **15-Minute Measurement R13—Residence at 11720 59th St Ct E—Field Data Sheet**

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR167 Extension Job # 160250S-AC

ID

SITE IDENTIFICATION: R13 OBSERVER(s): Romero Mauer
START DATE & TIME: 11/10/15 12:00 END DATE & TIME: 11/10/15 12:15
ADDRESS: 11720 59th St Ct E
GPS coordinates:

Weather

TEMP: 50 °F HUMIDITY: 40 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-5 MPH DIR: N NE E SE S SW W NW STEADY GUSTY ___MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other: ___

Acoustic Measurements

INSTRUMENT: LxT TYPE: 1 2 SERIAL #: 3981
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Yes
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER: ___

Rec #	Start Time / End Time								
R13	12:00 / 12:15	L_{eq} 68.7	L_{max} 73.8	L_{min} 63.5	L_{90} 65.1	L_{50} 68.2	L_{10} 70.8	C(1) 72.5	
___/___/___	:	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	
___/___/___	:	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	
___/___/___	:	L_{eq} ___	L_{max} ___	L_{min} ___	L_{90} ___	L_{50} ___	L_{10} ___	___	

COMMENTS:

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER ___
ROADWAY TYPE: SR167
COUNT DURATION: 10 -MINUTE

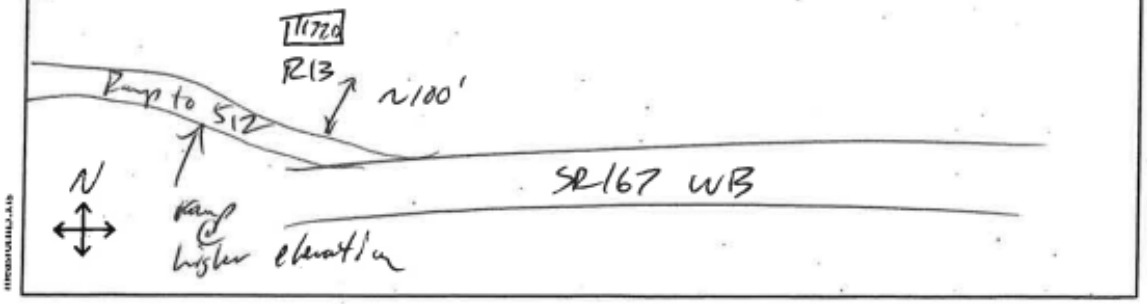
	SPEED (mph) NB / EB / SB / WB				#2 COUNT: NB / EB / SB / WB				SPEED (mph) NB EB / SB WB	
AUTOS:	422	155	55-60	55-60	___	___	___	___	___	___
MED. TRUCKS:	6	2	↓	↓	___	___	___	___	___	___
HVY TRUCKS:	30	16	↓	↓	___	___	___	___	___	___
BUSES:	___	___	___	___	___	___	___	___	___	___
MOTORCYCLES:	___	___	___	___	___	___	___	___	___	___

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER: ___

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER: ___
PHOTOS: digital
OTHER COMMENTS / SKETCH:



2
3

15-Minute Measurement R13—Residence at 4328 12th St E —Field Data Sheet

FIELD MEASUREMENT DATA SHEET

PB

Project Name: SR167 Extension Job # 160250S-AC

ID

SITE IDENTIFICATION: R14 OBSERVER(s): Romero Mauer
START DATE & TIME: 11/10/15 END DATE & TIME: 11/10/15
ADDRESS: 4328 12th ST E
GPS coordinates:

Weather

TEMP: 55 °F HUMIDITY: 40 % R.H. WIND: CALM LIGHT MODERATE VARIABLE
WINDSPEED: 0-5 MPH DIR: N NE E SE S SW W NW STEADY GUSTY 7 MPH
SKY: CLEAR SUNNY DARK PARTLY CLOUDY OVRCST FOG DRIZZLE RAIN Other:

Acoustic Measurements

INSTRUMENT: LXT TYPE: 1 2 SERIAL #: 3981
CALIBRATOR: LD CAL 200 SERIAL #: 11686
CALIBRATION CHECK: PRE-TEST 114.0 dBA SPL POST-TEST 114.0 dBA SPL WINDSCREEN Yes
SETTINGS: A-WEIGHTED SLOW FAST FRONTAL RANDOM ANSI OTHER:

Rec #	Start Time / End Time	
R14	12:45 / 1:00	L_{eq} 58.5, L_{max} 64.7, L_{min} 55.4, L_{90} 56.1, L_{50} 57.6, L_{10} 60.8, (1) 63.8
___ / ___		L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___, ___
___ / ___		L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___, ___
___ / ___		L_{eq} ___, L_{max} ___, L_{min} ___, L_{90} ___, L_{50} ___, L_{10} ___, ___

COMMENTS: Breezy to North

Source Info and Traffic Counts

PRIMARY NOISE(S): TRAFFIC (SR 509) AIRCRAFT RAIL INDUSTRIAL AMBIENT OTHER
ROADWAY TYPE: [illegible] & I-5 mobile in distance
COUNT DURATION: 10 -MINUTE

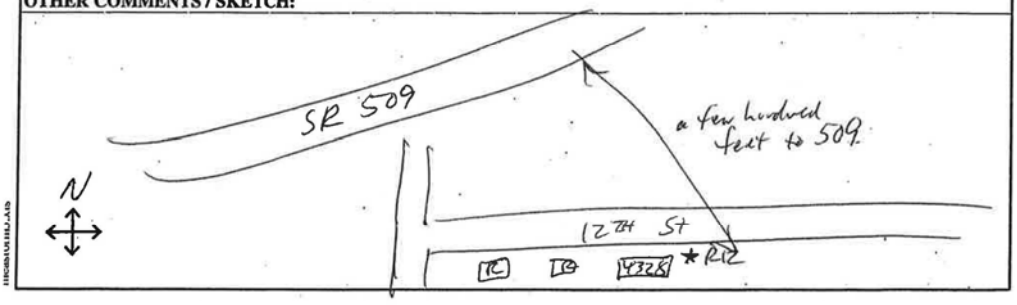
	SPEED (mph) NB / EB / SB / WB	NB EB/ SB WB	#2 COUNT: NB / EB / SB / WB	SPEED (mph) NB EB / SB WB
(509) AUTOS:	106 / 134	55 60 · 40 50	___ / ___	___ / ___
MED. TRUCKS:	0 / 2	↓ / ↓	___ / ___	___ / ___
HVY TRUCKS:	18 / 14	↓ / ↓	___ / ___	___ / ___
BUSES:	___ / ___	___ / ___	___ / ___	___ / ___
MOTORCYCLES:	___ / ___	___ / ___	___ / ___	___ / ___

SPEED ESTIMATED BY: RADAR / DRIVING / OBSERVER

OTHER NOISE SOURCES: distant AIRCRAFT overhead / RUSTLING LEAVES / distant BARKING DOGS / BIRDS
distant CHILDREN PLAYING / distant TRAFFIC / distant LANDSCAPING / distant TRAINS
OTHER:

Description / Sketch

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS: digital
OTHER COMMENTS / SKETCH:



505 S. Main Street, Suite 900, Orange, CA 92868, 714-835-6886

011 06 004

Appendix F —Modeling Site Descriptions

Appendix F provides additional information on modeling site locations and residential equivalency calculations.

Appendix F: Modeled Site Descriptions and Residential Equivalency Calculations

Site ID	Land Use / Site Description	Usage Factor Calculation (Hours/Day, Days/Week, Months/Year)[1]	Average Users at Site	Average Number of People Per Household[2]	Dwelling Units Residential Equivalency[3]
R1	*Puyallup Recreation Center	(10/24)*(7/7)*(5/12) = 0.17	50	2.53	3
M27	*Puyallup Recreation Center and Trail	(10/24)*(7/7)*(5/12) = 0.17	10	2.53	1
M61	** *Telecare Residential Treatment Facility*	(24/24)*(7/7)*(12/12) = 1	14	2.53	6
T1	*Hylebos Wildlife Trail	(10/24)*(7/7)*(5/12) = 0.17	10	2.53	1
T2	***Interurban Trail	(10/24)*(7/7)*(5/12) = 0.17	16	2.53	1
T3	****Milgard Nature Reserve	(10/24)*(7/7)*(5/12) = 0.17	10	2.53	1

Source:
**WSP | Parsons Brinckerhoff, 2015*
*** Anticipated daily census of 14.* https://fortress.wa.gov/ecy/separ/Main/SEPA/Record.aspx?SEPANumber=201704724
****WSDOT 2017*
*****Based on number of parking spots*

[1] Calculated using WSDOT's Residential Equivalency Calculations
[2] Average number of people per household in Washington State 2.53 (WSDOT, 2012)
[3] Dwelling Units Residential Equivalency = Usage Factor x Average Users at site ÷ Average Number of People per Household

Appendix G —Right of Way Scoping Estimate

Appendix G is a memorandum that provides an estimate of right of way costs to build Noise Barrier 3.

Washington State Department of Transportation

Memorandum

Olympic Region Real Estate Services
Right of Way Scoping Estimate

Unless otherwise noted, this Scoping Estimate includes projected appraisal, acquisition, relocation, demolition, property management and related costs that may be applicable.

SR	167	**PS&E Title**	SR 167/I-5 to SR 509 – Sound wall		
PE	Steve Fuchs	**Scoping Request Date**	3/7/2018	**Estimate Date**	3/12/2018
Revision to Prior Scoping Estimate?		No	**Date(s) of Prior Scoping Estimates**	N/A	

		Comments
Number of Parcels	20	
Estimated Cost	$1,800,326	This estimate will be outdated within 6 months and could be significantly outdated within 1 year depending upon market conditions.
Estimated Time to Acquire ROW	Up to 6 months	This estimate assumes sufficient staffing and availability of State employee resources for negotiation, appraisal management, appraisers, and no condemnations.
Field Visit? If No, explain.	No – This scope is a planning level estimate with insufficient time or budget for site visit	
Estimate Based on	Property information obtained from Pierce County Assessor's website, Materials and data supplied by data supplied by Tom Slimak. Market data was obtained from NWMLS.	
Assumptions	An approved right-of-way plan has not been completed. It is assumed that the easement area estimates do not differ significantly from that needed in the approved plans. The scoping estimate assumes a 12 foot sound wall anticipated to eliminate mountain and territorial views resulting in loss of property values. It also assumes there are no encumbrances requiring compensation to clear and that no improvements are present in the TCE areas. Ownership of the property rights to be acquired will require payment of just compensation.	
Attachments	Plan sheet and spread sheet	
Prepared by	Bill Moody	

C: Project File

SR 167 Noise Wall Scope

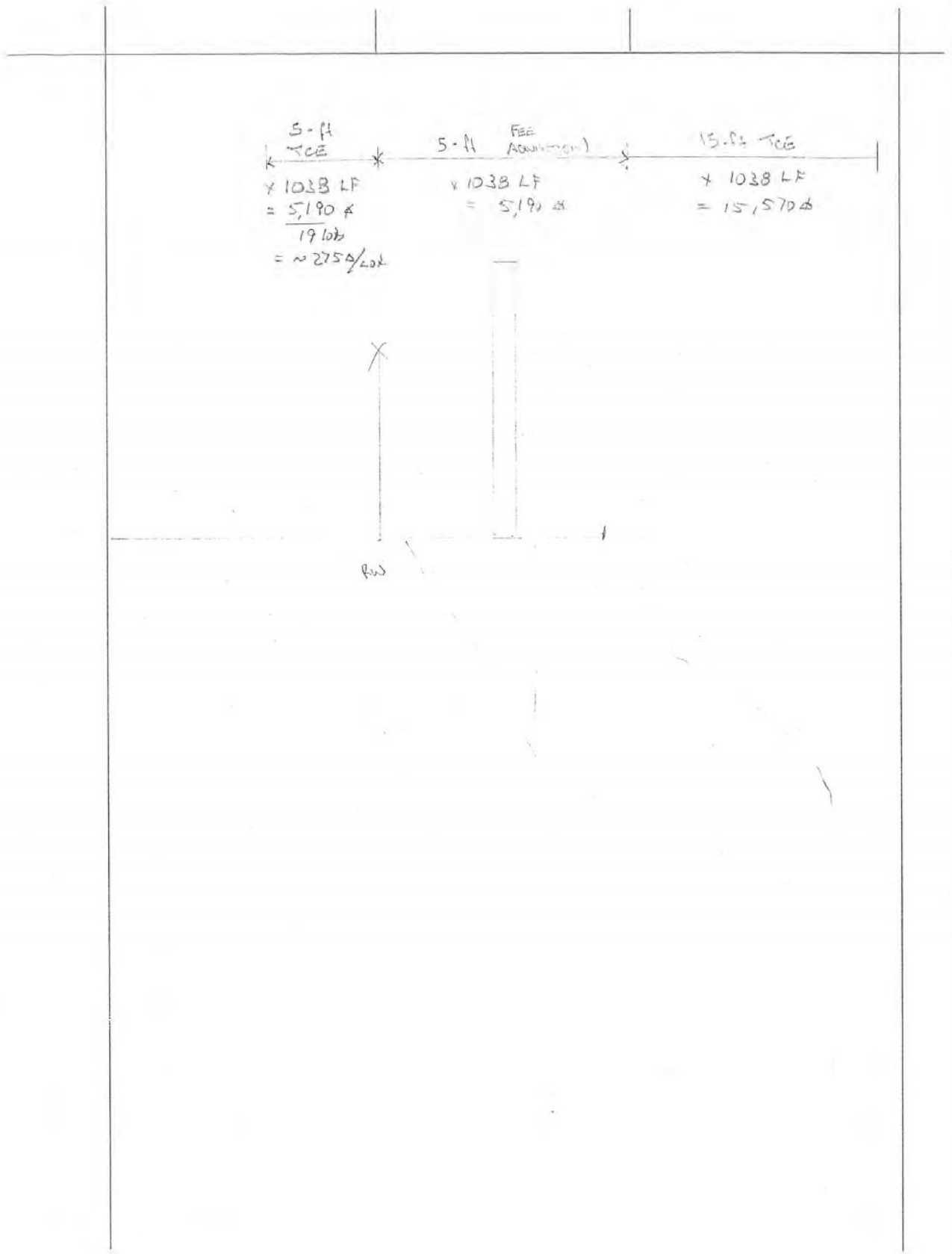
3/12/2018

Tax Parcel	Owner Name	View Damages	Acquisition	Acquisition Just Comp $ Est.	SEA	Total Labor	Condemnation and Incidental Cost - 30% **	Total Parcel Cost
6025220010	Rymaruk	$59,340	TCE & Damages	$61,525	$750	$12,250	$22,358	$96,883
6025220020	Snitko	$52,740	TCE & Damages	$56,006	$750	$12,250	$20,702	$89,708
6025220030	Wobbrock	$68,600	TCE & Damages	$72,142	$750	$12,250	$25,543	$110,684
6025220040	Parker	$54,880	TCE & Damages	$58,121	$750	$12,250	$21,336	$92,457
6025220050	Kibe	$50,200	TCE & Damages	$53,173	$750	$12,250	$19,852	$86,026
6025220060	Feurborn	$50,120	TCE & Damages	$53,078	$750	$12,250	$19,824	$85,902
6025220070	Uriostequi	$54,940	TCE & Damages	$58,193	$750	$12,250	$21,358	$92,551
6025220080	Peavler	$52,460	TCE & Damages	$55,667	$750	$12,250	$20,600	$89,267
6025220090	Ruff	$54,780	TCE & Damages	$57,735	$750	$12,250	$21,220	$91,955
6025220100	Tibbs	$54,780	TCE & Damages	$57,735	$750	$12,250	$21,220	$91,955
6025220110	Feurborn	$55,460	TCE & Damages	$58,726	$750	$12,250	$21,518	$93,244
6025220120	Guerroro	$52,560	TCE & Damages	$55,767	$750	$12,250	$20,630	$89,397
6025220130	Lucas	$52,980	TCE & Damages	$56,195	$750	$12,250	$20,759	$89,954
6025220140	Pham	$54,900	TCE & Damages	$58,442	$750	$12,250	$21,433	$92,874
6025220150	Srinivas	$54,900	TCE & Damages	$58,442	$750	$12,250	$21,433	$92,874
6025220160	IH5 Property	$52,480	TCE & Damages	$55,670	$750	$12,250	$20,601	$89,271
6025220170	IH5 Property	$52,340	TCE & Damages	$55,896	$750	$12,250	$20,669	$89,565
6205220180	Feurborn	$49,680	TCE & Damages	$53,207	$750	$12,250	$19,862	$86,070
6205220190	Lamoureux	$55,680	TCE & Damages	$58,646	$750	$12,250	$21,494	$93,140
6025220360	Community	None	Fee & TCE	$30,500	$750	$12,250	$13,050	$56,550
				$1,124,866	$15,000	$245,000	$415,460	$1,800,326

1

NB 3 located at property fence line of 19 individual parcels.
NB 3-Alt-B at edge of pavement of SR 99.
NB 3-Alt-A at edge of pavement of SR 99.
NB 3-Alt-C at edge of shoulder on off ramp, 6 ft. barrier.
PUGET SOUND GATEWAY SR167 COMPLETION PHASE 1
Washington State Department of Transportation
NOISE WALL ALTERNATIVES

1


5-ft TCE
x 1038 LF
= 5,190 ∡
19 lots
= ~275 ∡/lot
5-ft FEE ADMINISTRATION
x 1038 LF
= 5,190 ∡
15-ft TCE
x 1038 LF
= 15,570 ∡
RW

1

Appendix H —Relocation of Noise Barrier 3

WSDOT evaluated two alternatives for the location of Noise Barrier 3. See Appendix G for barrier locations. The first alternative location would move Noise Barrier 3 along the southbound I-5 off ramp, but this location was determined not to be feasible as it would not provide at least a 5 dBA reduction to first row homes. The second alternative location would move Noise Barrier 3 to the west edge of SR 99 and was determined to be feasible, but it would not be reasonable given this barrier would benefit the residential equivalency of 6 residences, which results in a reasonable allowance of $290,460, but would have a cost of $886,660.

Reasonableness Evaluation for Cost—Noise Barrier 3 Along SR 99

Site and Land Use Category	Dwelling Units/ Residential Equivalency	Existing (L_{eq}) (dBA)	Build (L_{eq}) (dBA)	Reasonableness Allowance		Minimum Design Goal 20-foot-tall Noise Wall	
				Per Modeled Receiver	Total Allowance	Total Cost	Insertion Loss (dBA)
M56	2	**68**	64	N/A	$290,460	$886,660	1
R5	3	**72**	**68**	$43,146			6
M57	3	**74**	**70**	$50,156			7
M58	4	**69**	63	N/A			1
M59	5	**68**	63	N/A			1
M60	2	**70**	65	N/A			1
Design Goal Achieved?						Yes	
Cost Effective?						No	

Impacts are noted by bolded values.
Reasonableness cost based on $51.61/ft^2
N/A = Noise reduction not achieved by evaluated noise barrier
See for definitions of Activity Categories.

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements Vicinity Map



Energy and Greenhouse Gas

COPY TO:	**Project File**
PREPARED BY:	**Ginette Lalonde and Rebecca Frohning, Energy Analyst, WSP USA**
DATE:	**September 27, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the Washington State Department of Transportation (WSDOT) Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to energy and greenhouse gas emissions.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of future Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

3. What has changed in the affected environment since 2006?

The affected environment and applicable regulatory requirements relative to energy, as described in Chapter 3.7 of the 2006 FEIS, generally remains applicable to the SR 167 Completion Project's new

proposed Phase 1 Improvements. The section below details certain aspects that have been updated or changed since 2006.

Pursuant to WSDOT guidance (WSDOT, February 2018), WSDOT analyzes the major direct and/or indirect effects of each project alternative on the energy needs for construction and facility operations and the potential for conservation measures.

For transportation projects, the major greenhouse gas is carbon dioxide (CO_2) from the combustion of fossil fuels. WSDOT requires a greenhouse gas analysis as part of an energy analysis for environmental discipline studies or required NEPA documentation. Greenhouse gas analyses were not required and therefore were not completed as part of the 2006 FEIS.

WSDOT's affected environment documentation requirements in Chapter 440 of WSDOT's Environmental Manual (WSDOT, June 2017) for energy and greenhouse gas analysis include:

- Energy and greenhouse gas guidance and regulations
- Energy and greenhouse gas analysis methodology

Changes to the affected environment documentation requirements for the proposed Phase 1 Improvements are described below.

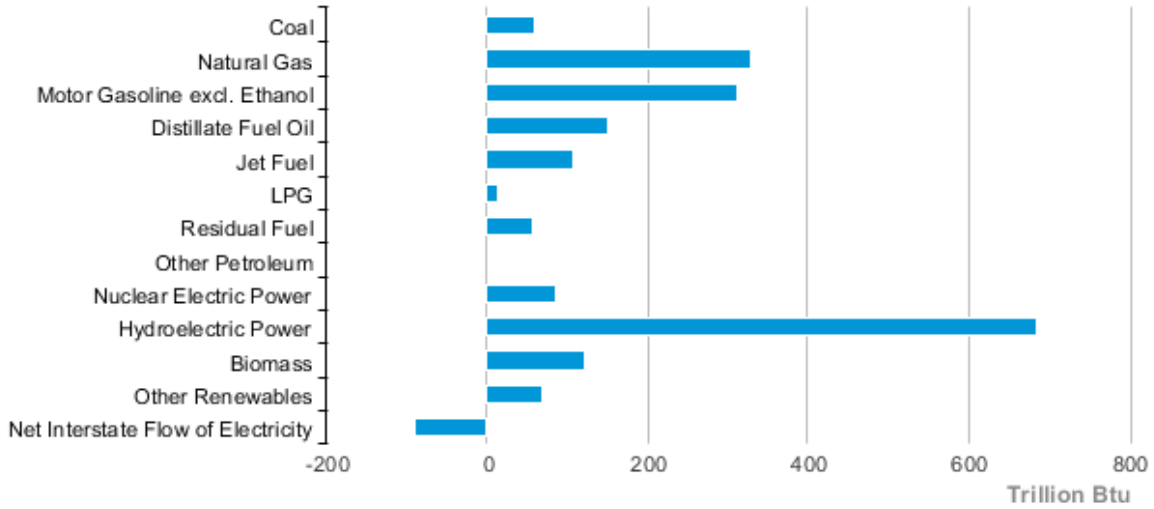
Energy

Transportation energy is the energy required to move people and goods from place to place. Transportation accounts for a major portion of the energy consumed in Washington State. Transportation energy is generally discussed in terms of operational and construction energy consumption. Operational energy consumption involves all energy consumed by vehicle propulsion. This energy is a function of traffic characteristics such as volume, speed, distance traveled, vehicle mix, and the thermal value of the fuel being used. Operational energy consumption also includes the energy required to maintain the transportation facilities. Construction energy consumption involves the one-time energy expenditure involved in construction of the physical infrastructure associated with the project.

Energy is commonly measured in terms of British thermal units ("Btu"s). A Btu is defined as the amount of heat required to raise the temperature of 1 pound of water by 1 degree Fahrenheit. Fossil fuels (e.g., gasoline, diesel fuel, and jet fuel) are the predominant source of energy for transportation in Washington state.

At the regional scale, energy consumption in Btu is counted in the millions to trillions (mBtu or tBtu, respectively). With an annual consumption of 1,982 tBtu in 2015, Washington consumes more energy than it produces (refer to Exhibit 1). Of this energy, roughly 52 percent came from fossil fuels (1,023 tBtu total). Renewable energy, such as hydroelectric, was the second-highest energy source consumed, at approximately 35 percent (684 tBtu), and biomass energy was third at 6 percent (122 tBtu) (EIA, 2017).

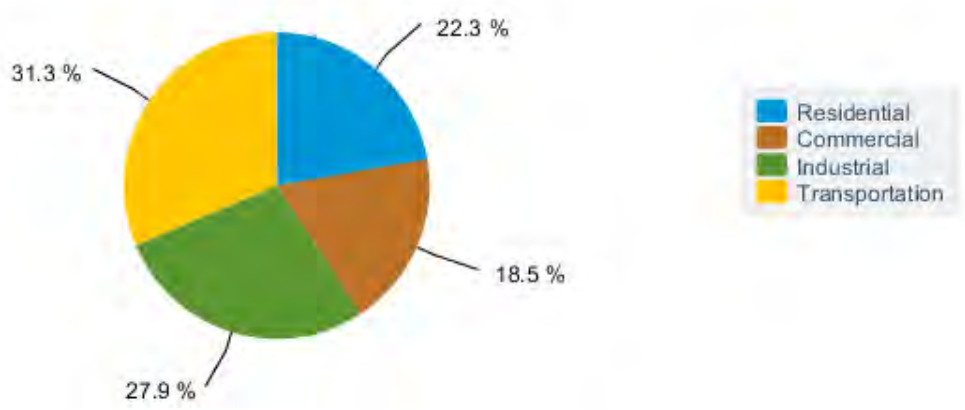
Exhibit 1: Washington Energy Consumption by Estimates, 2015



Source: EIA, 2017

In 2015, transportation was the highest end-use energy consumption sector in the state at roughly 31 percent (623 tBtu), followed by the industrial sector at 28 percent (555 tBtu), residential sector at 22 percent (443 tBtu), and commercial sector at 19 percent (368 tBtu) (EIA, 2017) (refer to Exhibit 2).

Exhibit 2: Washington Energy Consumption by End-Use Sector, 2015



Source: EIA, 2017

Within the energy study area, according to the Puget Sound Regional Council (PSRC) travel demand model which provided the base transportation data used in this analysis, most regional miles traveled are in passenger cars and light trucks. Public transit is expected to account for around 10 percent of the regional miles traveled by 2040. Freight traffic is also expected to account for a smaller portion of the regional miles traveled by 2040 as compared to passenger cars and light trucks.

Greenhouse Gas

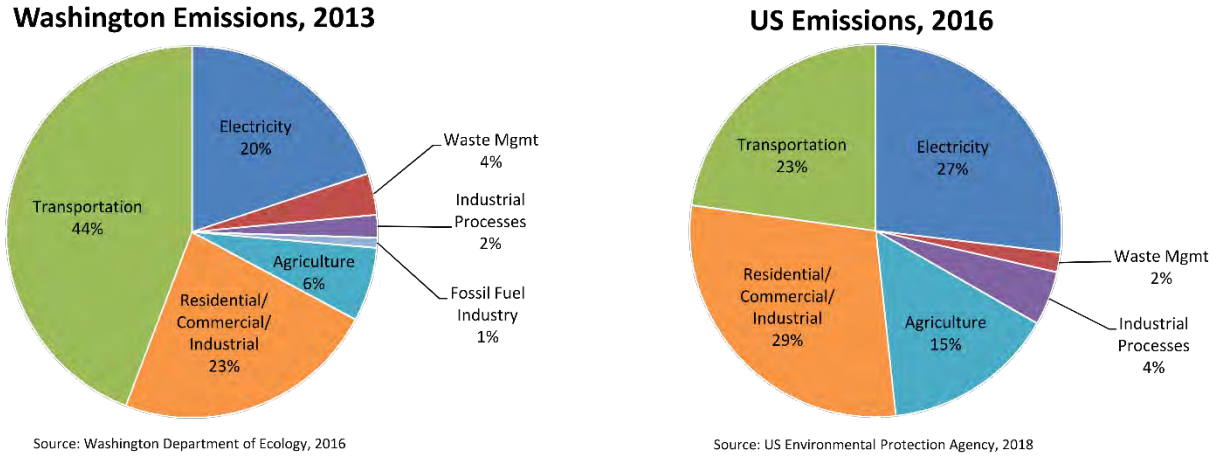
Greenhouse gas emissions are discussed in terms of operational and construction emissions.

Gases that trap heat in the atmosphere are called greenhouse gases (GHG). Vehicles emit a variety of gases during their operation; some of these are greenhouse gases, which include water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Any process that burns fossil fuel releases greenhouse gases into the air. CO_2 comprises the bulk of the greenhouse gas emissions from transportation activities.

Greenhouse gases differ in their ability to trap heat. For example, 1 ton of CO_2 has a different effect than 1 ton of CH_4. To compare emissions of different greenhouse gases, inventory compilers use a weighting factor called "Global Warming Potential" (GWP). To use a GWP, the heat-trapping ability of 1 metric ton (1,000 kilograms) of CO_2 is taken as the standard, and emissions are expressed in terms of CO_2-equivalent (CO_2e). The CO_2e for a gas is derived by multiplying the tons of the gas by the associated GWP. The GWP of CO_2 is 1. EPA's MOVES2014a model (EPA 2015) uses a GWP of 25 for CH_4, and a GWP of 298 for N_2O.

Vehicles are a substantial source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuel. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, rail, and boats) accounts for almost 30 percent of total U.S. domestic CO_2 emissions. However, in Washington State, transportation accounts for nearly half of the greenhouse gas emissions. This is because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total greenhouse gas emissions in Washington State are fossil fuel combustion in the residential/commercial/industrial sector at 22 percent, and in electricity consumption at 17 percent. Exhibit 3 shows the greenhouse gas emissions by sector, nationally, and in Washington State.

Exhibit 3: Greenhouse Gas Emissions by Sector in the US and Washington State



Source: WSDOT, February 2018

Energy and Greenhouse Gas Regulations and Guidelines

WSDOT's guidance for project-level energy and greenhouse gas analysis for this memorandum was developed through collaboration with internal and external experts (including the U.S. Department of Transportation, EPA, the Washington State Departments of Ecology and Commerce, the Puget Sound Regional Council (PSRC), and local clean air agencies, as well as an evaluation of other agency

approaches, and an assessment of the tools available for calculating greenhouse gas emissions. The relevant Federal and state regulations, standards, and guidelines are listed below.

Federal

- 42 United States Code (USC) 4321 regarding the National Environmental Policy Act (NEPA), and federal implementing regulations 23 Code of Federal Regulations (CFR) 771 (FHWA) and 40 CFR 1500.1-1500.8 (Council on Environmental Quality).
- President's Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management.
- FHWA Technical Advisory T 6640.8A for NEPA documents.
- U.S. Department of Transportation Guidance on Fuel Consumption and Air Pollution, including Order 5610.1C, Energy Requirements for Transportation Systems, and Procedure for Estimating Highway User Costs, Fuel Consumption, and Air Pollution.

State

- State Environmental Policy Act (SEPA) and implementing regulations; Chapter 197-11 Revised Code of Washington (RCW), and Chapter 468-12 Washington Administrative Code (WAC).
- Chapter 39.35D RCW requires that new "major facility projects" achieve the "Leadership in Energy and Environmental Design" (LEED) silver building rating standard.
- WSDOT Guidance—Project-Level Greenhouse Gas Evaluations under NEPA and SEPA (2018).

Energy and Greenhouse Gas Analysis Methodology

Operational Analysis

A project-level regional analysis was conducted to estimate the SR 167 Project's proposed Phase 1 Improvements impact on regional energy consumption and greenhouse gas emissions in King and Pierce Counties.

Energy consumption and greenhouse gas emissions from vehicle operations on the SR 167 Completion Phase 1 Improvements and other nearby roadway facilities that are directly affected by the project were estimated using the latest version of EPA's MOVES2014a model (EPA 2015). In addition to the vehicle operations modeled using MOVES2014a, the fuel cycle CO_2e emissions and energy consumed have been calculated. The fuel cycle includes emissions released through extraction, refining, and transportation of fuels used by vehicles traveling in the project area. Fuel cycle emissions were calculated by applying the FHWA fuel cycle factor (0.27) to the MOVES2014a modeled results.

Following the WSDOT guidance at the time, energy consumption was qualitatively assessed in the 2006 FEIS, but greenhouse gases were not evaluated at that time. Greenhouse gas emissions were not discussed at all. As previously described, a quantitative analysis for energy and greenhouse gas emissions is now required under the current WSDOT guidance.

Analysis Years

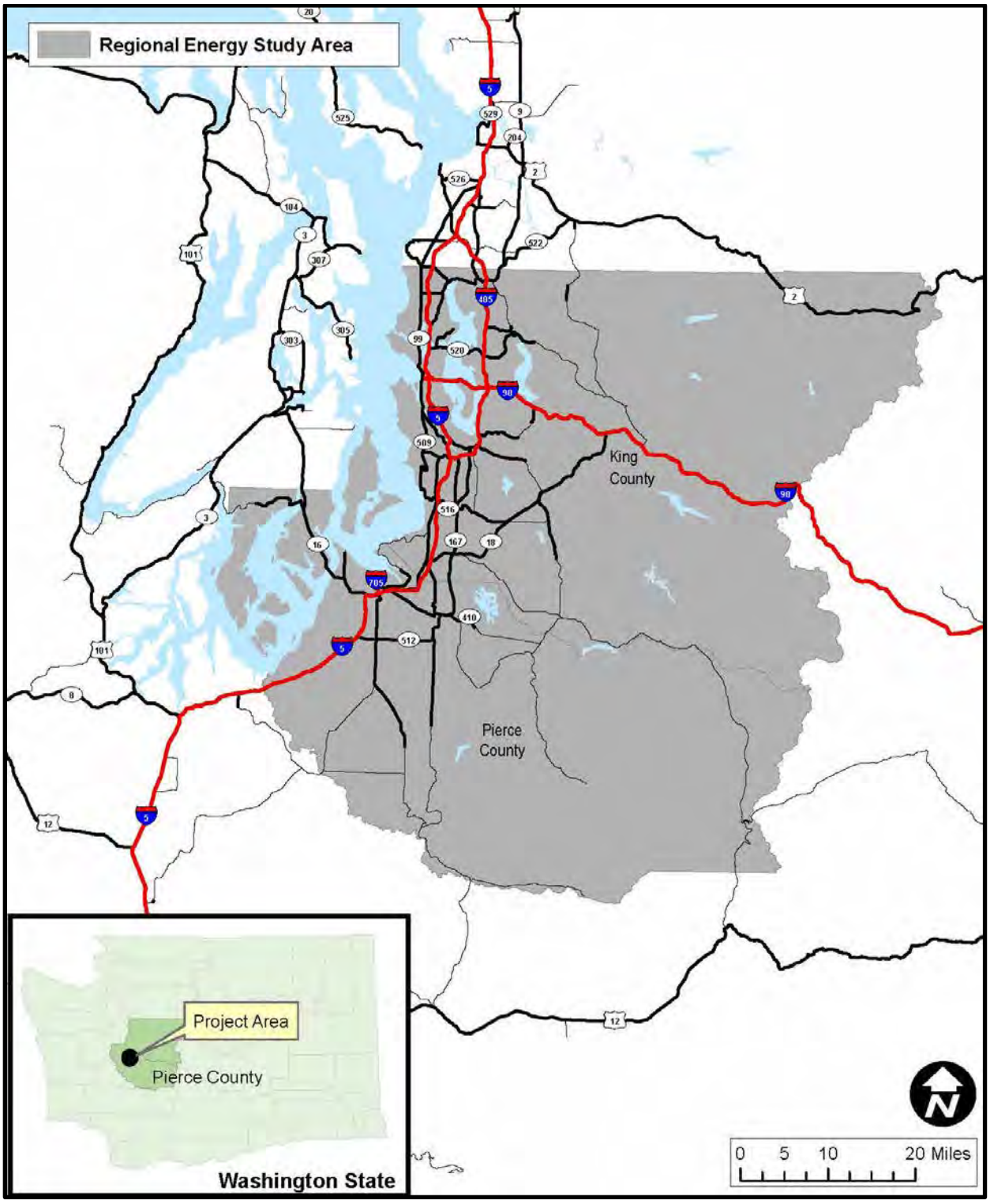
The operational analysis was conducted for existing conditions (2015) and the project's design year (2045).

Study Area

The study area includes roadways in Pierce and King counties because the proposed Phase 1 Improvements have the potential to impact traffic on these roads. The project's regional study area is shown on Exhibit 4. The nature of greenhouse gas emissions and energy use means that the overall changes resulting from the project are of interest, regardless of where they occur, and not just localized emissions. This analysis is based on the roadways in the PSRC regional model in King and Pierce Counties, and estimates daily energy and emissions with and without the Puget Sound Gateway Program (encompasses both the SR 167 Completion Project and SR 509 Completion Project).

The 2006 FEIS analysis qualitatively discussed energy effects, as effective tools to quantify energy use were not available at that time.

Exhibit 4: Regional Study Area



Regional Modeling Inputs

For WSDOT projects, EPA's MOVES model is used to estimate regional emission factors. In the Puget Sound region, the PSRC provides county-specific parameters when available, otherwise, MOVES default inputs are used. Table 2 shows the source of inputs used.

Table 2. Area-Specific MOVES2014a Parameters

County	County-specific Inputs Provided by PSRC	County Default Inputs
King	Vehicle age distribution Fuel Meteorological data Inspection and maintenance area information	Advanced fuel and technology
Pierce	Vehicle age distribution Fuel Meteorological data Inspection and maintenance area information Advanced fuel and technology	None used

Traffic Data

Regional traffic data has been updated since the 2006 FEIS. Traffic data (e.g., year of analysis, traffic volumes, operating speed, link length for each section, speeds and volumes, time period of the data [hours of the day], and vehicle fleet mix) were supplied by the SR 167 Completion Project's transportation team and are documented in the project's final Transportation Discipline Report (WSDOT, April 2018). The operational energy and greenhouse gas analysis was completed using this updated traffic data.

Analysis of Construction Effects

Construction energy use was qualitatively assessed in the 2006 FEIS. A quantitative analysis is now required under the current WSDOT guidance. Construction and maintenance energy consumption and greenhouse gas emissions were calculated using FHWA's "Infrastructure Carbon Estimator" (ICE) spreadsheet tool, which incorporates project features and construction traffic delays to calculate CO_2e emissions and energy consumption from construction equipment, materials, and routine maintenance.

4. Would the Phase 1 Improvements result in any new or significant impacts?

Analysis of the Phase 1 Improvements affirms the conclusion of the 2006 FEIS – the project will not result in any significant impacts.

Energy Impacts

Energy consumption under both the Build and No Build (2045) alternatives is expected to be less than Existing Conditions (2015), despite an increase in miles traveled in the study area (Table 3). This decrease in energy consumption is expected as federal fuel economy standards are phased in.

The estimated energy consumption for the 2045 Build scenario is slightly higher than that for the No Build scenario; the increase is attributed to the 0.5 percent increase in vehicle miles traveled (VMT). As noted above, the Build scenario energy consumption is well below Existing Conditions.

The proposed Phase 1 Improvements would not result in a significant environmental impact regarding energy consumption, which is consistent with the 2006 FEIS qualitative energy analysis.

Table 3. 2045 Yearly Roadway Vehicle Energy Consumption

Area	2015 Existing	2045 No Build	2045 Phase 1 Improvements
Vehicle Miles Traveled	18,470,785,650	22,334,511,000	22,453,605,000
Percent Vehicle Miles Traveled increase compared to Existing	-	20.9%	21.6%
Percent Vehicle Miles Traveled increase compared to No Build	-	-	0.5%
Tailpipe Energy Consumption (mBtu)	110,269,149	81,104,688	84,787,837
Fuel Cycle Energy Consumption (mBtu)	29,772,670	21,898,266	22,892,716
Energy Consumption (mBtu) increase compared to Existing	-	-26.4%	-23.1%
Energy Consumption (mBtu) increase compared to No Build	-	-	4.5%

Notes: mBtu = million British thermal units

Greenhouse Gas Impacts

The 2006 FEIS did not address greenhouse gases, as WSDOT did not have greenhouse gas guidelines or requirements at that time.

Estimated Build and No Build (2045) greenhouse gas emissions are predicted to be less than Existing Conditions (2015), despite an increase in regional vehicle miles traveled (Table 4). This decrease in emissions is expected as federal fuel economy standards are phased in.

SR 167 Phase 1 Improvements (2045) greenhouse gas emissions are predicted to increase by 4.6 percent as compared to a No Build scenario (2045), which is attributed to the 0.5 percent increase in VMT. As noted above, the Build scenario greenhouse gas emissions are estimated to be well below Existing Conditions.

The SR 167 Phase 1 Improvements would not result in a significant environmental impact regarding greenhouse gas emissions.

Table 4. 2045 Yearly Roadway Vehicle Greenhouse Gas Emissions

Area	2015 Existing	2045 No Build	2045 Phase 1 Improvements
Vehicle Miles Traveled	18,470,785,650	22,334,511,000	22,453,605,000
Percentage Vehicle Miles Traveled increase compared to Existing	-	20.9%	21.6%
Percentage Vehicle Miles Traveled increase compared to No Build	-	-	0.5%
Tailpipe Greenhouse Gas Emissions (Metric Tons)	9,283,537	6,825,553	7,136,759
Fuel Cycle Greenhouse Gas Emissions (Metric Tons)	2,506,555	1,842,899	1,926,925
Percent increase Greenhouse Gas Emissions compared to Existing	-	-26.5%	-23.1%
Percent increase Greenhouse Gas Emissions compared to No Build	-	-	4.6%

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Consistent with the findings of the 2006 FEIS, the SR 167 Completion Project's new proposed Phase 1 Improvements would not result in a significant environmental impact regarding operational energy and greenhouse gas emissions, and no mitigation is proposed.

As detailed above, no significant impacts on energy use and greenhouse gas emissions are predicted, therefore no mitigation measures are proposed for operational conditions. The 2006 FEIS Energy Analysis also concluded that no mitigation was necessary for operational conditions of the 2006 Build Alternative.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The proposed Phase 1 Improvements would not result in any new temporary construction effects, which is consistent with the findings of the 2006 FEIS Energy Analysis.

Effects during construction and maintenance energy consumption and greenhouse gas emissions were calculated using FHWA's Infrastructure Carbon Estimator (ICE) spreadsheet tool, which incorporates project features and construction traffic delays to calculate CO_2e emissions and energy consumption from construction equipment, materials, and routine maintenance. Inputs for the ICE tool are detailed in Attachment C.

The Phase I Improvements analysis includes the effects of constructing the project. Table 5 reports FHWA's ICE tool construction of project features CO_2e emissions and energy consumption results annualized per year over a 20-year period. Construction energy impacts are temporary or short-term in nature. Energy used during construction of the Phase I Improvements and in the manufacture of construction materials would be irretrievable. However, construction of this alternative would not adversely affect the continued availability of energy, because the scale of the proposed project is negligible when compared to energy production in Washington state, the United States, or globally.

Table 5. Annualized Construction and Maintenance Energy Consumption and CO_2e Emissions, per year over 20 years

Scenario	Estimated CO2e Emitted (metric tons per year over 20 years)	Total Estimated Energy Consumed (mmBtu per year over 20 years)
No Build[1]	59	819
Proposed Phase 1 Improvements[2]	981	14,171

1. Only includes routine maintenance activities.
2. Includes both construction and routine maintenance activities.

The above construction impacts to energy consumption are similar to what was documented in the 2006 FEIS, and construction of the proposed SR 167 Phase 1 Improvements and design features would not result in a measurable impact on regional or local fuel availability.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The 2006 FEIS identified no mitigation measures for energy or greenhouse gas emissions.

Since then, WSDOT has established standard practices to reduce energy use and greenhouse gas emissions from construction. These practices include:

- The project traffic control plan will include detours and strategic construction timing (such as night work) to continue moving traffic through the area and reduce backups and delays to the traveling public to the extent possible.
- WSDOT will also work with its partners to promote ridesharing and other commute trip reduction efforts for employees working on the project.
- WSDOT contractors will set up active construction areas, staging areas, and material transfer sites in a way that reduces standing wait times for equipment during construction.

8. Conclusion

The proposed Phase 1 Improvements will have no significant impacts relative to energy or greenhouse gas from either construction or operations, confirming the finding of the 2006 FEIS.

References

EIA (U.S. Energy Information Administration), 2017. Washington State Total Energy Consumption by Sector for 2015. December. Available at: http://www.eia.gov/state/?sid=WA Accessed December 11, 2017.

U.S. Environmental Protection Agency (EPA). *MOVES2014a Motor Vehicle Emission Simulator,* 2015. https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves.

EPA (U.S. Environmental Protection Agency), 2017. Sources of Greenhouse Gas Emissions. Available at: http://www3.epa.gov/climatechange/ghgemissions/sources.html. Accessed December 11, 2017.

WSDOT (Washington State Department of Transportation). WSDOT Guidance - Project-Level Greenhouse Gas Evaluations under NEPA and SEPA. Environmental Services, February 2018. Available at: http://www.wsdot.wa.gov/sites/default/files/2017/05/08/Env-Energy-GHGGuidance.pdf Accessed: May 30, 2018.

WSDOT, April 2018. *Transportation Discipline Report* for NEPA Re-Evaluation of Phase 1, SR 167 Completion Project.

WSDOT, June 2017. *Environmental Manual* (M 31-11). Chapter 440, Energy.

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements



Attachment C -- Infrastructure Carbon Estimator Tool

The WSDOT Environmental Manual (M 31-11, February 2018) requires the use of FHWA's "Infrastructure Carbon Estimator" (ICE) spreadsheet tool to calculate GHG emissions from fuel usage, traffic delays, and maintenance emissions resulting from the construction of the projects. FHWA's new ICE spreadsheet tool incorporates project features and construction traffic delays to estimate emissions from construction equipment, materials, and routine maintenance. The SR 167 Completion (proposed Phase 1 Improvements) project-specific inputs were obtained from the SR 167 design team (WSDOT, March 2018) as inputs for the ICE model.

The inputs provided below were used to generate annualized energy consumption in million British Thermal Units per year, and GHG emissions in metric tons (MT) of CO2 equivalent per year. GHG emissions were calculated for upstream and direct emissions. Upstream GHG emissions are associated with the lifecycle emissions embodied in the materials used in construction, including raw materials extraction, raw materials transportation, materials production (such as crushing of aggregate and asphalt batch plants), and chemical reactions in materials (calcination of limestone). Direct GHG construction emissions are related to fuel usage in project construction equipment and routine maintenance.

SR 167 Completion (proposed Phase 1 Improvements) Project Specific Inputs

Portions of the Existing Roadway that are not new, but will be reconstructed:

- Total Existing Centerline miles: 4.9
- Total existing lane miles: 21.04

Project NEW Roadway miles

- New Roadway lane miles: 21.02
- Construction of Additional lanes to existing roadways (new off/on-ramps to existing roadway) lane miles: 5.4
- Re-Alignment lane miles: 3.2
- Lane widening lane miles: 2.3
- Shoulder improvement centerline miles: 0

Project SINGLE Span Structures

- New Bridges- Number of Bridges: 11
- New Bridges- Average number of Lanes per bridge: 3.1
- Reconstructed Bridges- Number of Bridges: 3
- Reconstructed Bridges- Average number of Lanes per bridge: 3
- Add Lane to Bridges- Number of Bridges: 1
- Add Lane to Bridges- Average number of Lanes per bridge: 3

Project TWO-Span Structures

- New Bridges- Number of Bridges: 3
- New Bridges- Average number of Lanes per bridge: 3.5
- Reconstructed Bridges- Number of Bridges: 0

- Reconstructed Bridges- Average number of Lanes per bridge: N/A
- Add Lane to Bridges- Number of Bridges: 0
- Add Lane to Bridges- Average number of Lanes per bridge: N/A

Project MULTI-Span Structures over land

- New Bridges- Number of Bridges: 1
- New Bridges- Average number of Lanes per bridge: 4
- New Bridges- Average number of Spans per bridge: 2.8
- Reconstructed Bridges- Number of Bridges: 1
- Reconstructed Bridges- Average number of Lanes per bridge: 4
- Reconstruction Bridges- Average number of Spans per bridge: 4
- Add Lane to Bridges- Number of Bridges: 0
- Add Lane to Bridges- Average number of Lanes per bridge: N/A
- Add Lane to Bridges- Average number of Spans per bridge: N/A

Project MULTI-Span Structures over water

- New Bridges- Number of Bridges: 0
- New Bridges- Average number of Lanes per bridge: N/A
- New Bridges- Average number of Spans per bridge: N/A
- Reconstructed Bridges- Number of Bridges: 0
- Reconstructed Bridges- Average number of Lanes per bridge: N/A
- Reconstruction Bridges- Average number of Spans per bridge: N/A
- Add Lane to Bridges- Number of Bridges: 0
- Add Lane to Bridges- Average number of Lanes per bridge: N/A
- Add Lane to Bridges- Average number of Spans per bridge: N/A

Parking

- Surface Parking Spaces: 24
- Structured Parking Spaces: 0

Bicycle and Pedestrian Facilities

- New Construction- Off-street Bicycle or pedestrian path – miles: 1.02
- Resurfacing- Off-street Bicycle or pedestrian path – miles: 0.6
- New Construction- On-street sidewalk – miles: 0.4
- Resurfacing- On-street sidewalk – miles: 0

Construction Delays

There are approximately 102 project-nights of lane closures expected on I-5 during construction at this time. This analysis assumes that the annual average nightly traffic would be 14,000 vehicles on I-5 and that 50% of the lanes in each direction would be closed during construction. Night time traffic closures assumed are based on

the current I-5 HOV construction closure in the vicinity, partial closure are assumed to take place between 10:30 p.m. and 4 a.m. in the northbound direction and from 11 p.m. to 5 a.m. in the southbound direction. Hourly traffic volumes are based on WSDOT traffic counts on I-5 at Enchanted Parkway between April 5 and June 30, 2016 (Tuesdays to Thursdays only). Because traffic volumes on I-5 are so great, no additional construction delays were included in the ICE model.

STAGE 1A	
Location	**Closure**
I-5 & Proposed 70th Ave Bridge	12 nights at 50% closure in both directions
I-5 & Existing 70th Ave Bridge Demo	12 nights at 50% closure in both directions

STAGE 1B	
Location	**Closure**
I-5 Structures over Hylebos Creek	240 nights/1 lane each direction = approximately 60 nights at 50% closure of both directions
Porter Ave Structure over I-5	12 nights at 50% closure in both directions
Porter Ave Structure over I-5 Demo	6 nights at 50% closure in both directions

STAGE 2
Location
No mainline I-5 closures

Mitigation Inputs

Currently no mitigation inputs have been provided. As the proposed Phase 1 Improvements near construction, the contractor may incorporate recycled asphalt material or other measures to reduce GHG emissions.

References

WSDOT (Washington State Department of Transportation). SR 167 Design Team Email from WSDOT's Thomas Slimak. March 7, 2018.

Hazardous Materials

COPY TO:	**Project File**
PREPARED BY:	**Glenn A. Hayman LHg, Principal, INNOVEX Environmental Management, Inc.**
DATE:	**June 18, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to hazardous materials.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup terminus of SR 167, SR 410, and SR 512; and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of certain work elements, e.g., the Puyallup River Bridge Replacement

Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 Improvements. Attachment B depicts the Phase 1 Improvements Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-feet), 60 MPH posted speed	4 lanes (78-feet), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-feet): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-feet): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right-hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-feet): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-feet): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: the first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

An updated Hazardous Materials analysis was conducted in 2017 to re-evaluate the known hazardous materials sites along the SR 167 Completion Project corridor in Pierce County, Washington. The Analysis is intended to support WSDOT's NEPA re-evaluation process by assessing potential risks of the hazardous material sites associated with, or potentially impacted by, the new proposed Phase I Improvements.

The affected environment relative to hazardous materials described in Section 3.8.2 of the 2006 FEIS generally remains applicable to the proposed Phase 1 Improvements. In the State of Washington, the Model Toxics Control Act (MTCA), a citizen-mandated toxic waste cleanup law, regulates the way hazardous waste sites in this state are cleaned up. It sets strict cleanup standards to ensure that the quality of cleanup and protection of human health and the environment are not compromised. At the same time, the rules that guide cleanup under the Act have built-in flexibility to allow cleanups to be addressed on a site-specific basis. Cleanups are conducted under the rules written by the Department of Ecology, and adopted to implement that Act (Chapter 173-340 WAC). Since 2006, the MTCA has been revised twice, once in 2007 and again in 2013. The revisions primarily clarified portions of the rules, reorganized some sections, and corrected errors. The actual site discovery, characterization, and cleanup processes were not revised. Hence, there have been no updated hazardous materials or cleanup related regulations and/or guidance that would require the implementation of new methods of analysis for the proposed Phase 1 Improvements. The methodology used for the current analysis is consistent with that used to support the 2006 FEIS documentation. A summary of the current methodology and findings is provided below.

Previous environmental documents prepared in support of the 2006 FEIS were reviewed to identify sites of potential concern within one mile of the Phase 1 Improvements alignment. These documents included:

- Hazardous Materials Discipline Study (WSDOT, 2001)
- Initial Site assessment for UPRR Wetland Mitigation Site – Fife WA (WSDOT, 2004)

Additional resources used to identify sites of potential concern as of 2017 included:

- Washington Department of Ecology (Ecology) online database "Facility/Site Identification System," (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Facility-Site-database); and (https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx)
- Electronic Data Resource (EDR) Reports of the project area (EDR, 2017a; 2017b)

The current analysis identified 221 sites of potential concern within one mile of the proposed Phase 1 Improvements footprint. The sites of potential concern included state cleanup sites, Voluntary Cleanup Program sites (VCP), independent cleanup sites, sites with Underground Storage Tanks (USTs), hazardous waste generators, sites with reported hazardous material spills, sites with solid waste landfills, and Leaking Underground Storage Tank (LUST) sites. These locations commonly have soil and/or groundwater contamination that could affect the SR 167 project.

The sites are prioritized (ranked) according to the extent of contamination and distance from the SR 167 Phase 1 Improvements Project corridor. Sites were eliminated from further consideration if they met one or more of the following criteria:

- Hazardous waste generators with no reported on-site contamination or release of hazardous materials;
- Sites that have received No Further Action (NFA) notices from Ecology with no conditions or covenants;
- Sites that contain USTs but are located outside of the project footprint;
- Sites that contain solid waste landfills but are located outside of the project footprint;
- Sites with historically reported LUSTs located greater than one-half mile away from the project footprint;
- Sites that have historically reported spills or releases of hazardous materials but are located outside of the project footprint;
- Contaminated sites hydraulically downgradient of the Riparian Restoration Program (RRP) areas;
- Contaminated sites downgradient and/or located greater than one-half mile from the project footprint;
- Contaminated sites located upgradient of the project footprint, but where no project subsurface structures are planned; or
- State hazardous waste cleanup sites located outside of the footprint with cleanup complete.

This screening determined that of the thirty-one (31) sites that were identified in Section 3.8.2 of the 2006 FEIS, the following thirteen (13) sites were eliminated given they met one or more of the criteria listed above:

- Commencement Bay/Nearshore, Tideflats Superfund Site
- Firwood Gym (FS# N/A)
- Jesse Engineering Company (FS# 2222235)
- All State Industrial Marine (FS# 12129963)
- Specialized Transport Service (FS# 4113425)
- Milgard Tempering (FS# 16795744)
- S and J Trucking (FS# 53436847)
- Valley Avenue Residences (FS# 95563821)
- Don Olson Construction (FS# 52358672)
- Tosco #03139 (FS# 72452584)
- UPRR – Fife Switching Yard
- SR 99 Property (FS# N/A)
- Portac Inc. (FS# 1215)

However, the following eight (8) new sites were identified:

- Former Delicor of Puget Sound, Inc.
- Wood Chip Storage Yard
- WSDOT Property – 6722 Pacific Hwy E.
- Pryzbylski Property – 6912 Pacific Hwy E.
- WSDOT Property – 6924 Pacific Hwy E.
- WSDOT Property – 6713 Pacific Hwy E.
- Boening Residential Property
- PSE Puyallup, SVC

In summary, twenty-six (26) identified hazardous materials sites are presented on Figure 1 and summarized in Table 2, as potentially impacted by or that pose risk to the SR 167 Phase 1

Improvements. The sites are further classified (ranked) in Table 2 as "High," "Moderate," or "Low Risk" as described below and in accordance with WSDOT's Hazardous Materials Discipline Report Guidance (https://www.wsdot.wa.gov/sites/default/files/2017/07/05/Env-HazMat-DiscRptGuidance.pdf):

- "High Risk" sites are sites of concern that may be substantially contaminated and will create a major liability for WSDOT either in construction liability or by virtue of acquiring all or a portion of the site. If the site has undergone a detailed investigation and feasibility study, the impacts and remediation costs may already be predicted. Nonetheless, the site is identified as a high impact site because of its potentially substantial impact or liability. In general, high risk sites are properties that may have large volumes of contaminated soil, groundwater, or sediment or properties that have multiple complex types of contaminants that require special handling and disposal that is expensive to manage. High risk sites include properties where the information necessary to predict remedial costs is lacking and/or the contaminants are persistent or expensive to manage.

- "Moderate Risk" sites are sites of concern where the likelihood for the site to impact the project is moderate because of the type or extent of contamination, groundwater from the site of concern is impacted and has a reasonable potential to impact the project footprint from offsite migration of groundwater, but there is no conclusive evidence.

- "Low Risk" sites are sites of concern where the likelihood for the site to impact the project is low because there is no evidence to suggest that groundwater from the site of concern is impacted, or the contamination from off-site migration is not expected to impact the project during construction.

They are located either within the project footprint or within one-half mile hydraulically up-gradient of the project where contaminated groundwater has potential to impact the project.

Sites identified as "Low Risk" are due to the limited extent of contamination, cleanup activities previously performed, and/or distance from the project footprint. As WSDOT continues to acquire more property for the project, site visits or characterizations may further assess "Low Risk" parcels that may contain hazardous materials.

The major construction activity associated with Phase 1 of the SR 167 Completion Project where contaminated soil and groundwater could be encountered is in areas where drilled shafts are necessary along the project corridor. It is anticipated that four of the sites listed will potentially have ground or sub-surface disturbance activity during construction that may result in encountering hazardous materials. These properties are identified in Table 2 and discussed below. Table 2 also provides detailed site information and individual assessments of the risks for each of the sites of concern. Figure 1 shows the site locations along the project corridor.

Table 2: SR 167 Completion Project - Sites of Potential Concern
Department of Ecology Facility Site Review

Number	Facility Site ID (FSID)[1]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
Areas 1 and 2						
1	97814788	Auto Warehousing Co.	3715 SR 509 N. Frontage Road, Tacoma, WA	Leaking underground storage tank (LUST) with remediated petroleum and non-halogenated solvent contamination in groundwater and soil. Cleanup has started.	One-half mile downgradient/cross gradient from the project footprint.	Low Risk. The project is located one-half mile downgradient / cross gradient to the project. Cleanup activities began in 2008.
2	26693246	Coast Engine & Equipment Corp	4012 SR 509, Tacoma, WA	Ecology No Further Action (NFA) reported in November 2016. Remediated metal, petroleum product, and non-halogenated solvent contamination in groundwater. Remediated arsenic, metals, petroleum product, and phenolic compound contamination in soil.	Located adjacent and potentially upgradient to the project footprint.	Low Risk. Site received an NFA in 2016.
3	3514** (71984716)	Former Delicor of Puget Sound Inc. site.	5200 4th St E, Tacoma, WA	Underground contamination may be present from a former single walled underground storage tank (UST) that was removed in 1996.	Located adjacent to the project footprint and the Fife Ditch crossing.	Moderate Risk. UST has been removed but condition of the site remains uncertain. Moderate likelihood of encountering contaminated groundwater.
4	6766480	Wood Chip Storage Yard	SR 509 N & 4th ST E, Tacoma, WA	Confirmed arsenic contamination in soil, suspected arsenic contamination in groundwater and surface water. Suspected additional metals contamination to soil. Site is awaiting cleanup.	Located approximately 200 feet north of project footprint. Not acquiring source.	Low Risk. This site lies approximately 200 feet north (and across 4th Street E) of property that will be acquired for the project. Low likelihood that arsenic contamination in groundwater has migrated away from the site onto WSDOT property.
Area 3						
5	84531356	USG Interiors Inc. 99 Site	7110 Pacific Hwy E, Tacoma, WA	Heavy arsenic contamination in soil, groundwater, and surface water. Cleanup has started.	Within the project footprint. Project will acquire this property.	High Risk due to the site location within the project footprint. Hotspots of arsenic contamination remain in soil and groundwater. In-situ remediation in place. Construction of the I-5 southbound off ramp could interfere with remediation. Project will acquire contaminant source area. Strong likelihood of encountering arsenic contamination during relocation of Hylebos Creek.
6	42781887	North American Crane & Equipment Co LLC	405 Porter Way, Milton, WA	Asarco smelter slag potentially used as fill in the area. Remediated petroleum product contamination in soil.	May be within project footprint, but undetermined at this time. Project may be acquiring this property for riparian restoration.	High Risk due to the potential presence of Asarco smelter slag in the fill. Petroleum contamination resulting from a tractor trailer accident has been remediated and the Site received an NFA in 2011. Characterization of soil and groundwater will reduce the risk of discovering contamination during construction.
7	89863773	H & H Diesel	407 Porter Way, Milton, WA	Confirmed arsenic, lead, non-halogenated solvents, petroleum products, and benzene contamination and suspected metals contamination in soil. Suspected arsenic contamination in surface water. Metals and petroleum products contamination in groundwater. Site has been removed from the VCP for lack of cleanup action and response (2013).	May be within the project footprint, but undetermined at this time. Project may be acquiring this property.	High Risk due to the site location potentially within the project footprint, known contamination on property, and potential presence of Asarco smelter slag in the fill. The project will encounter contamination during excavation of site fill and riparian restoration activities.
8	23264	WA DOT Property	6722 Pacific Hwy E, Fife, WA	Arsenic contamination in groundwater and benzene contamination in soil. Site is awaiting cleanup.	Within the project footprint. Site already purchased by the project.	High Risk due to the site location within the project footprint. Site is awaiting cleanup. Strong likelihood project will encounter contamination if drilled shafts are constructed on the property.
9*	N/A	Pryzbylski Property	6912 Pacific Hwy E, Fife, WA	Mineral oil spill reported on the property in 2006. Suspected pesticides, petroleum product, polycyclic aromatic hydrocarbon (PAH), and phenolic compound contamination in groundwater.	Within the project footprint. Site may be acquired by the project.	High Risk due to the site location within the project footprint. Strong likelihood project will encounter contamination. Characterization of soil and groundwater will reduce the risk of discovering contamination during construction.

Notes:
1 – For more information on each of these Washington State Department of Ecology cleanup sites, enter the FSID into: https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx.
* - Drilled shaft construction anticipated on property.
** - Washington State Department of Ecology UST ID. Historical FSID in parenthesis.
Shaded cells indicate sites newly identified during the current (2017) Analysis (i.e., did not appear in the 2006 FEIS).

Table 2 (cont.): SR 167 Completion Project - Sites of Potential Concern
Department of Ecology Facility Site Review

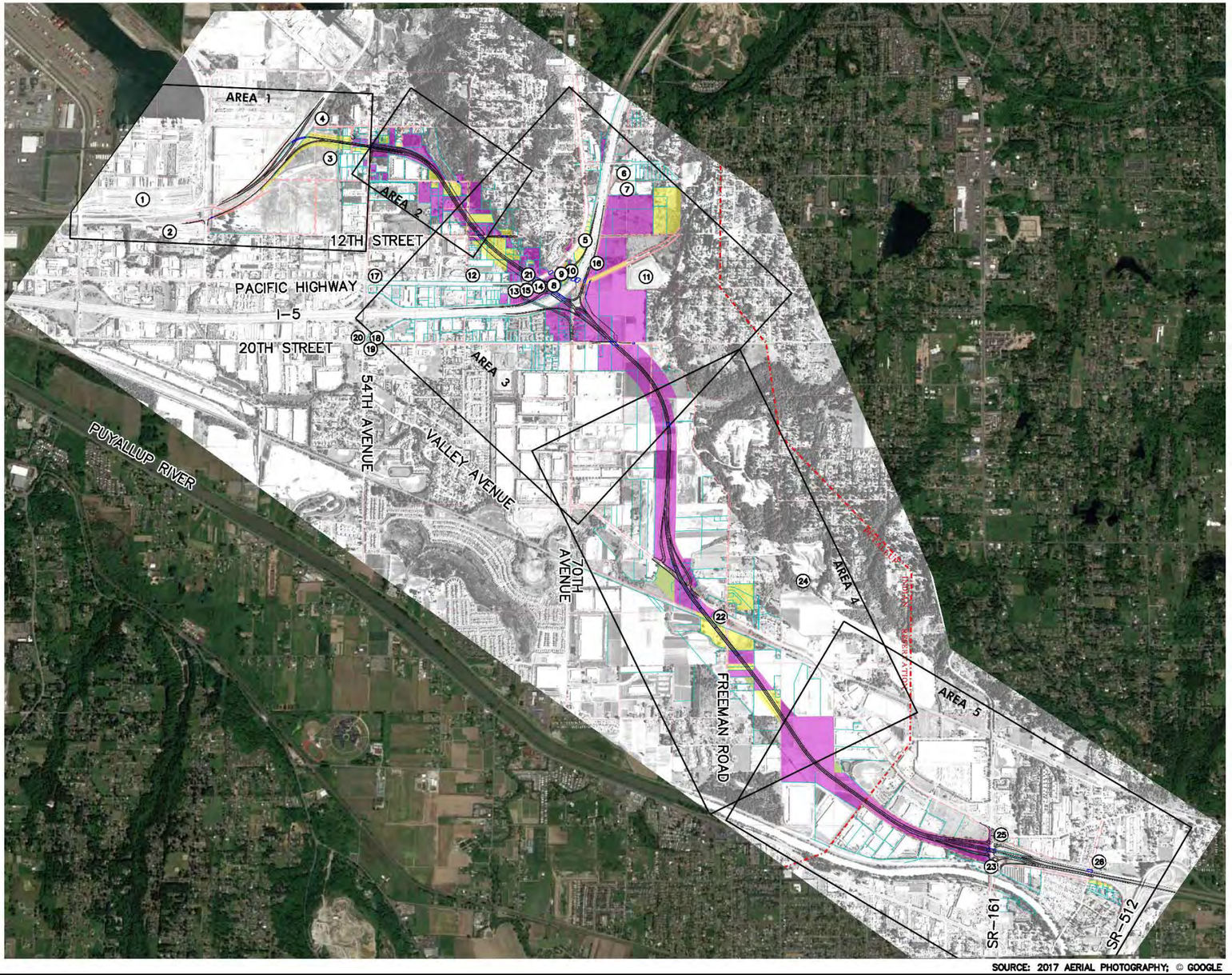
Number	Facility Site ID[1]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
Area 3 (cont.)						
10*	2314625	WA DOT Property	6924 Pacific Hwy E, Fife, WA	Heating oil spill reported on the property in 2006. Pesticides, petroleum product, PAH, and phenolic compound contamination confirmed in groundwater and suspected in soil. Site is awaiting cleanup.	Within the project footprint. Site already purchased by the project.	High Risk due to the site location within the project footprint. Site is awaiting cleanup. Strong likelihood project will encounter contamination. Characterization of soil and groundwater will reduce the risk and cost of discovering contamination during construction.
11	1203	B&L Wood Waste	Milton Way, Milton, WA	Arsenic contaminated soil and groundwater. Cleanup actions largely constructed. Contaminant source remains, site is in monitoring phase.	Adjacent to the project footprint.	Moderate Risk due to the site location adjacent to the project footprint. This site has been well characterized, cleanup action construction is largely complete, and site is in monitoring phase. Low likelihood project will encounter contamination in groundwater or soil during riparian restoration.
12	37432679	Commercial Sales Inc. / Century Link QC	1427 62nd Ave E, Fife, WA	Suspected diesel contamination in groundwater. Remediated diesel contamination in soil. UST potentially on site.	Located approximately 700 feet west and cross gradient of the project footprint. Project will not acquire this property.	Low Risk. Past site reconnaissance recorded tanks, parts, and equipment on the site.
13	5969** (43644518)	Liberty Distributing Co / Vitamilk Dairy fife	6527 Pacific Hwy E, Fife, WA	Possible ACM and lead contamination remains. Former USTs onsite have been removed. No additional information (2017).	Within the project footprint. Project has already acquired this property.	Low Risk. A hazardous building materials assessment will reduce the risk of discovering hazardous materials during construction.
14*	N/A	Rick Sexton drums	6716 Pacific Hwy E, Fife, WA	Possible ACM and lead contamination. No additional information (2017).	Within the project footprint. Already acquired by the project.	Low Risk. A hazardous building materials assessment will reduce the risk of discovering hazardous materials during construction.
15	9072** (28927352)	Richard Johnson Property	6708 Pacific Hwy, Fife, WA	Two USTs remain on the site. No additional information (2017).	Within the project footprint.	Low Risk if USTS are removed before construction.
16	N/A	Olympic Pipeline	Follows I-5 closely from Puyallup River to SR 18	No known contamination. Jet fuel, diesel, and gasoline product running through the pipe 24 hours per day.	Within the project footprint.	Moderate Risk assuming the risks associated with damaging the pipeline are fully accounted for during planning, design, and/or pipeline re-location prior to construction.
17	62556434	Circle K Store 5486 BP Oil (formerly BP Tosco 11073)	5405 Pacific Hwy E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Located 1,000 feet down gradient from project footprint.	Low Risk due to proximity of the site to the project area. Cleanup has begun at this site. Petroleum products are relatively straight forward to manage if encountered.
18	96352712	Shell Station 121396 (formerly Texaco)	5501 20th St E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Close proximity to the project footprint. Located 400 feet up gradient.	Low Risk due to being upgradient of the project area. Cleanup has begun at this site. Low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur.
19	4687	Unocal Service Station 4836 Former	2001 54th Ave E, Fife, WA	Petroleum contamination in soil and groundwater. Cleanup has started.	Close proximity to the project footprint. Located 400 feet up gradient.	Low Risk due to being upgradient of the project area. Ecology routine cleanup ended in 2008. Petroleum products are relatively straight forward to manage if encountered. Low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur.
20	47389264	Chevron (formerly CAC Inc. 97135)	5319 20th St. E, Fife, WA	Metals and non-halogenated solvent (including Methyl tert-butyl ether [MTBE]), petroleum and PAH contamination in groundwater, and petroleum and PAH contamination in soil. Cleanup has started.	Close proximity to the project footprint.	Low Risk due to being upgradient / cross gradient of the project area and low potential for contamination to migrate in the groundwater to where excavations are anticipated to occur. Cleanup has begun at this site. The size of the contaminated plume has not been delineated. MTBE and benzene are very mobile in groundwater but have a low potential to impact the project.

Notes:
1 – For more information on each of these Washington State Department of Ecology cleanup sites, enter the FSID into: https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx.
* - Drilled shaft construction anticipated on property.
** - Washington State Department of Ecology UST ID. Historical FSID in parenthesis.
Shaded cells indicate sites newly identified during the current (2017) Analysis (i.e., did not appear in the 2006 FEIS).

Table 2 (cont.): SR 167 Completion Project - Sites of Potential Concern
Department of Ecology Facility Site Review

Number	Facility Site ID[1]	Site Name	Address	Summary of Contamination	Proximity to the Project Footprint	Risk Assessment
Area 3 (cont.)						
21*	N/A	WA DOT Property	6713 Pacific Hwy E, Fife, WA	Suspected petroleum contamination in soil and confirmed petroleum contamination in groundwater from a leaking UST discovered in 2017.	Within project footprint.	High Risk due to the site location within the project footprint. Strong likelihood project will encounter contamination. Characterization of soil and groundwater will reduce the risk and cost of discovering contamination during construction.
Area 4						
22	95563821	Firwood Grocery	8124 Valley Ave E, Fife, WA	Confirmed petroleum contamination in soil and suspected petroleum contamination in groundwater. Suspected UST.	Located upgradient of project footprint. A decision on acquisition of this property is pending.	Moderate risk due to the confirmed presence petroleum contamination in the soil and groundwater.
Area 5						
23	N/A	SR167 / 20E Steel Bridge	North Meridian, Puyallup, WA	Lead based paint on structure.	Currently located within project footprint. Steel truss is scheduled for removal or demolition by mid-2019, prior to start of Project's Stage 2 construction.	Low Risk if lead based paint is managed appropriately during removal or demolition of the steel truss, prior to construction.
24	23957	Boening Residential Property	3824 90th Ave E, Edgewood, WA	Suspected metals, non-halogenated solvents, and diesel contamination in soil. Suspected diesel contamination in groundwater. Site is awaiting cleanup.	Located adjacent to proposed Riparian Restoration Area.	Low Risk. Contamination is only suspected.
25	22931178	Tesoro Station #62052 (Formerly Arco #5898)	102 Valley Ave NE, Puyallup, WA	LUST site with petroleum product and MTBE contamination to groundwater. Site received an NFA in 2002.	Located adjacent/upgradient of the project footprint.	Moderate Risk. Site received an NFA for cleanup activities conducted, however MTBE is very mobile and may have migrated into the project footprint.
26	1313	PSE Puyallup, SVC	5807 Milwaukee Ave E. Puyallup, WA	Confirmed halogenated organics, metals, non-halogenated solvents, petroleum hydrocarbon, and PCB contamination in groundwater. Cleanup has started.	Located Approximately 750 feet cross gradient of the project footprint.	Low Risk due to being located cross gradient of the project footprint.

Notes:
1 – For more information on each of these Washington State Department of Ecology cleanup sites, enter the FSID into: https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx.
* - Drilled shaft construction anticipated on property.
** - Washington State Department of Ecology UST ID. Historical FSID in parenthesis.
Shaded cells indicate sites newly identified during the current (2017) Analysis (i.e., did not appear in the 2006 FEIS).



SOURCE: 2017 AERIAL PHOTOGRAPHY; © GOOGLE

SR167_COMPLETION_17Q4_13.DWG

0 1,250 2,500
SCALE IN FEET

N
W E
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LEGEND

ACQUIRED PARCEL
PARCEL TO BE ACQUIRED

SOURCE

1. AUTO WAREHOUSING CO.
2. COAST ENGINE & EQUIPMENT CORP
3. DELICOR OF PUGET SOUND INC.
4. WOOD CHIP STORAGE YARD
5. USG INTERIORS INC. 99 SITE
6. NORTH AMERICAN CRANE & EQUIPMENT CO LLC
7. H & H DIESEL
8. WSDOT PROPERTY– 6722 PACIFIC HWY E.
9. PRYZBYLSKI PROPERTY– 6912 PACIFIC HWY E.
10. WSDOT PROPERTY– 6924 PACIFIC HWY E.
11. B & L WOODWASTE LANDFILL
12. CENTURY LINK QC
13. LIBERTY DISTRIBUTING CO/VITAMILK DAIRY FIFE
14. RICK SEXTON DRUMS
15. RICHARD JOHNSON PROPERTY
16. OLYMPIC PIPELINE
17. CIRCLE K STORE 5486 BP OIL (FORMERLY BP TOSCO 11073)
18. SHELL STATION 121396 (FORMERLY TEXACO)
19. FORMER UNOCAL SERVICE STATION 4836
20. CHEVRON (FORMERLY CAC INC. 97135)
21. WSDOT PROPERTY– 6713 PACIFIC HWY E.
22. FIRWOOD GROCERY
23. SR167 / 20E STEEL BRIDGE
24. BOENING RESIDENTIAL PROPERTY
25. TESORO STATION #62052 (FORMERLY ARCO #5898)
26. PSE PUYALLUP, SVC

FIGURE 1

Hazardous Materials Locations

SR167 Completion
FIFE, WASHINGTON

4. Would the Phase 1 Improvements result in any new or significant impacts?

The newly identified impacts related to hazardous materials from the Phase 1 Improvements are summarized below. The identified sites are segregated into five geographic areas for ease of illustration and discussion purposes, as depicted on Figure 1.

Areas 1 and 2

The identified hazardous materials sites in Areas 1 and 2 do not vary significantly from the sites identified in the 2006 FEIS. Two new hazardous materials sites not listed in the 2006 FEIS were identified in Areas 1 and 2 during the current Analysis.

WSDOT does not plan to acquire the former Delicor of Puget Sound Inc. property (Figure 1 Number 3), but it is adjacent to the project footprint. The site had a registered UST which was removed in 1996. The former Delicor property is identified as "Moderate Risk," due to the potential for encountering contaminated groundwater during construction.

The Woodchip Storage Yard (Figure 1 Number 4), located 200 feet north of the project footprint with documented arsenic contamination in soil, was identified as "low risk" during the current Analysis. There is a low likelihood that contaminated groundwater from this site would migrate into the project footprint.

Area 3

The identified hazardous materials sites in Area 3 do not vary significantly from the sites documented in the 2006 FEIS. Three hazardous materials sites previously identified in Area 3 in the 2006 FEIS were identified as "High Risk" during the current Analysis.

The "High Risk" sites previously identified in Area 3 included USG Interiors Inc. 99 (Figure 1 Number 5) and H & H Diesel (Figure 1 Number 7). If WSDOT ultimately determines to purchase these properties for the alignment or riparian restoration areas, WSDOT will acquire sources of arsenic contamination and will potentially assume ongoing cleanup liability/risk.

The Olympic Pipeline (Figure 1 Number 16) was also identified as "Moderate Risk" because of the various product fuels that continuously flow through it. However, the pipeline area is not known to be contaminated, or to have had spills/ releases of fuels to the environment. At this time WSDOT anticipates having to re-locate a portion of the pipeline. This will be handled as a utility issue, with all due planning and care to avoid impacting the pipeline during WSDOT's construction of the Phase 1 Improvements.

Finally, North American Crane and Equipment Company LLC (Figure 1 Number 6) was identified as "High Risk" due to the potential presence of Asarco smelter slag in the fill.

Four new sites were identified during this current Analysis in Area 3 that were not documented in the 2006 FEIS. Two of the newly identified sites are WSDOT-owned parcels located near the I-5 Interchange

and were assessed to be “High Risk” (Figure 1 Numbers 8 and 10). These parcels both have confirmed soil and groundwater contamination and are awaiting cleanup. Additionally, drilled shaft construction could potentially occur on Number 10. Another newly identified WSDOT-owned property, was assessed to be “High Risk” due to a leaking UST discovered and removed in 2017. This parcel (Figure 1 Number 21) has suspected petroleum contaminated soil and confirmed petroleum contaminated groundwater. Drilled shaft construction could potentially occur on this property. Finally, one newly identified property, the Pryzbylski Property, which WSDOT may acquire, was assessed to be “High Risk.” This parcel (Figure 1 Number 9) is adjacent to Number 10 and is suspected of having similar groundwater contamination. Drilled shaft construction could potentially occur on this property.

Area 4

Of the hazardous materials sites in Area 4 identified in the 2006 FEIS, only the Firwood Grocery (Figure 1 Number 22) remains as a hazardous materials site. No new hazardous materials sites were identified in Area 4 during this Analysis.

Area 5

The identified hazardous materials sites in Area 5 do not vary significantly from the sites identified in the 2006 FEIS. Two new hazardous materials sites were identified in Area 5 during this Analysis.

The Boening residential property (Figure 1 Number 24), is located adjacent to a proposed RRP Area, and was assessed to be “Low Risk.” This property has suspected metals, non-halogenated solvents, and diesel contamination in soil, and suspected diesel contamination in groundwater. However, this parcel will not be acquired by WSDOT, and is not anticipated to be impacted.

PSE Puyallup, SVC (Figure 1 Number 26) was identified due to confirmed halogenated organics, metals, non-halogenated solvents, petroleum hydrocarbon, and PCB contamination in the groundwater. However, this property was assessed to be “Low Risk” due to its location approximately 750 feet cross-gradient from the project footprint.

Additional Properties

There are still multiple properties planned for acquisition by WSDOT. There is the potential that undocumented spills or releases have contaminated environmental media at these properties. Furthermore, a portion of the RRP area is located near rail lines which may contain heavy metals, petroleum, and creosote contamination associated with rail activities.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative

The characterization and remediation of contamination has progressed at many of the sites identified by this updated analysis. The potential mitigation measures outlined in Section 3.8.4 of the 2006 FEIS remain applicable to the SR 167 Phase 1 Improvements during operations phase and will be implemented by WSDOT.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects discussed in the Build Alternative of Section 3.8.3 of the 2006 FEIS remain generally applicable to the Phase 1 Improvements; however as provided in Section 4 of this technical memorandum, the following sites were removed from consideration via the screening and ranking criteria, and are thus no longer applicable:

- Commencement Bay/Nearshore, Tideflats Superfund Site
- Firwood Gym (FS# N/A)
- Jesse Engineering Company (FS# 2222235)
- All State Industrial Marine (FS# 12129963)
- Specialized Transport Service (FS# 4113425)
- Milgard Tempering (FS# 16795744)
- S and J Trucking (53436847)
- Valley Avenue Residences (FS# 95563821)
- Don Olson Construction (FS# 52358672)
- Tosco #03139 (FS# 72452584)
- UPRR – Fife Switching Yard
- SR 99 Property (FS# N/A)
- Portac, Inc (FS# 1215)

Furthermore, as also discussed in Section 4 of this technical memorandum, the following sites were newly identified as hazardous materials sites with risks (High, Medium, or Low) posed to the SR 167 Phase 1 Improvements:

- Former Delicor of Puget Sound, Inc.
- Wood Chip Storage Yard
- WSDOT Property – 6722 Pacific Hwy E.
- Pryzbylski Property – 6912 Pacific Hwy E.
- WSDOT Property – 6924 Pacific Hwy E.
- WSDOT Property – 6913 Pacific Hwy E.
- Boening Residential Property
- PSE Puyallup, SVC

The temporary construction impacts discussed in Section 3.8.3 of the 2006 FEIS remain generally applicable to the Phase 1 Improvements.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The characterization and remediation of contamination has progressed at many of the sites identified by this analysis. The mitigation measures outlined in Section 3.8.6 of the 2006 FEIS remain applicable for the SR 167 Phase 1 Improvements during construction and will be implemented by WSDOT.

8. Conclusion

As described in Section 3 of this technical memorandum, twenty-six (26) sites, as compared to thirty-one (31) sites identified in the 2006 FEIS, are located either within the proposed SR 167 Phase 1 Improvements footprint or within one-half mile up-gradient of the project where contaminated groundwater has potential to impact the project.

No new significant impacts related to hazardous materials from construction and operation not already identified in the 2006 FEIS would occur with the proposed Phase 1 Improvements. The mitigation measures and environmental commitments included in the 2006 FEIS and required by the 2007 ROD remain applicable and are sufficient to address the risks from the identified hazardous materials sites. No significant unavoidable adverse effects and/or impacts that cannot be reasonably mitigated for are anticipated for this project.

References

Electronic Data Resource (EDR), 2017a. EDR DataMap Area Study. Fife, Washington. November 10, 2017.

EDR, 2017b. EDR DataMap Area Study. Fife, Washington. December 15, 2017.

Washington State Department of Transportation (WSDOT), 2001. SR167 Tier-2 Hazardous Materials Discipline Study, Pierce County, Washington. September 21, 2001.

WSDOT, 2004. Initial Site Assessment for Union Pacific Railroad Wetland Mitigation Site, Fife, Washington. April 20, 2004.

WSDOT, 2006. SR167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation. Pierce County, Washington. November 2006.

WSDOT, 2018. Discipline Report Guidance, at: https://wsdot.com/sites/default/files/2017/07/05/Env-HazMat-DiscRptGuidance.pdf

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Attachments

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Attachment A – 2006 FEIS Build Alternative



Attachment A: 2006 FEIS Build Alternative

Attachment B – Phase 1 Improvements Vicinity Map



Attachment B: Phase 1 Improvements Vicinity Map

Visual Quality

COPY TO: **Project File**

PREPARED BY: **Linda Fretts, Assistant Landscape Architect, Roadside Restoration, Environmental & Hydraulic Services Office, WSDOT Olympic Region**

DATE: **March 13, 2018**

SUBJECT **NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to visual quality.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed

SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

The affected environment relative to visual quality described in Section 3.9.2 of the 2006 FEIS, remains applicable to the proposed Phase 1 improvements. The visual character of a project area consists of the built and natural environment as perceived by residents, area workers, and those traveling through the area on the freeway or other roads. Since 2006, there have been increases in commercial and industrial development in the valley and within the project area resulting in decreases in agricultural use.

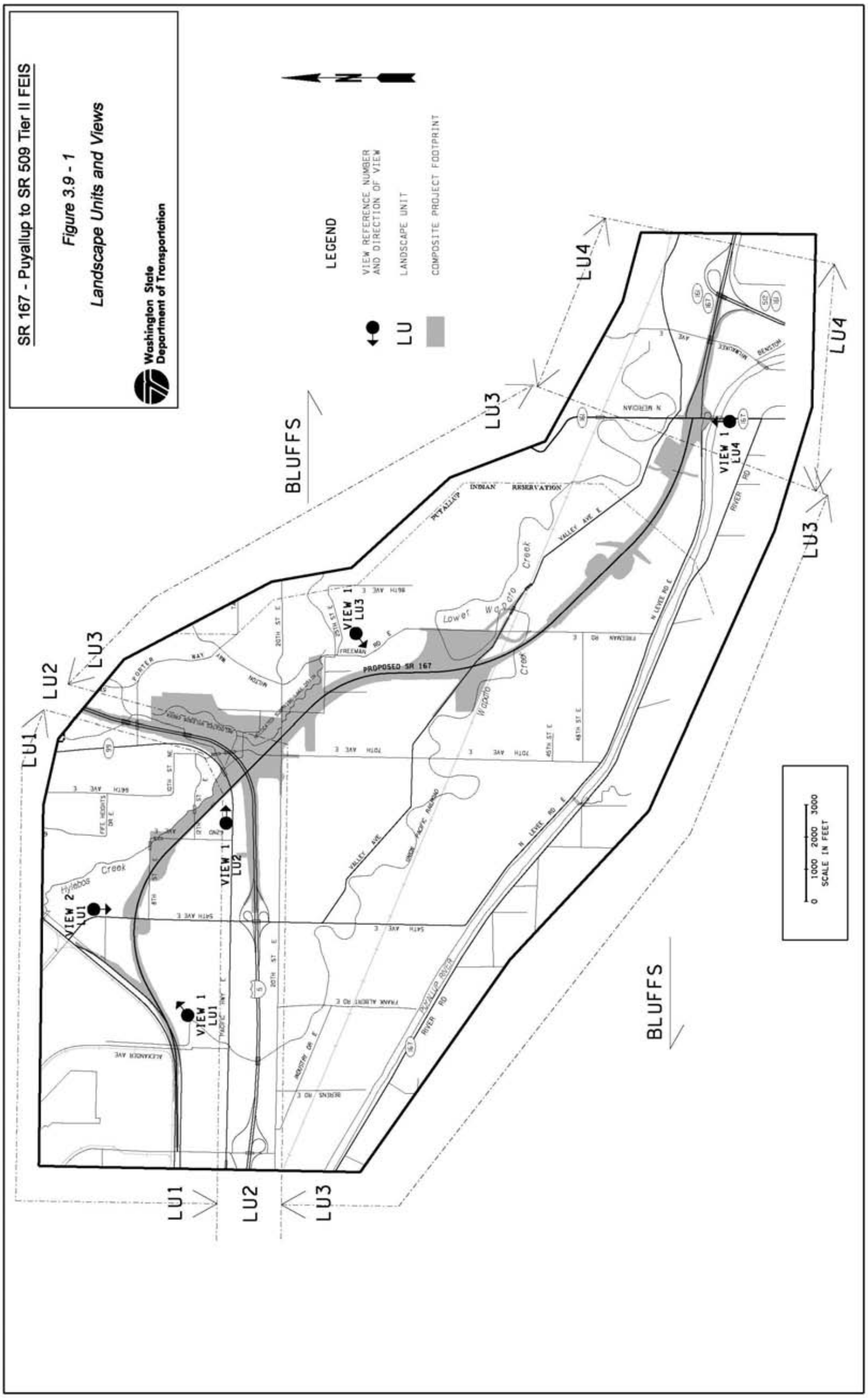
In 2001, a Visual Quality study was conducted by WSDOT in accordance with The United States Department of Transportation, FHWA publication *Visual Impact Assessment for Highway Projects, 1988.* That study was the basis for the 2006 Tier II FEIS documentation. The method for evaluating visual quality was based on objective descriptions used to quantify the visual impacts. The three criteria used to perform an appraisal of the landscape visual quality included vividness, intactness and unity. Each of the three criteria were independent and each was intended to evaluate one aspect of visual quality. For each criterion, the evaluator assigned a rating from 10 to 0 for very high to very low, respectively.

In January 2015 the U.S. Department of Transportation, FHWA published "Guidelines for the Visual Impact Assessment of Highway Projects". The document provides guidelines to assess the visual impacts of highway projects and to produce a visual impact analysis by defining the area of visual effect, examining the visual quality, and evaluating the degree of impact (Adverse, Neutral, or Beneficial) of a project. The qualitative methods described in the 2015 document are comparable to the quantitative methods used for the visual assessment for the 2006 FEIS. Both the 2006 FEIS visual assessment and the 2015 guidelines by the FHWA use geographic units grouped along the project route on which impacts to visual character and visual quality are assessed. These geographic units share similar visual resource characteristics and are called "Landscape Units." Within the Landscape Units, "Key Views" are established which encompass views both of and from the project area.

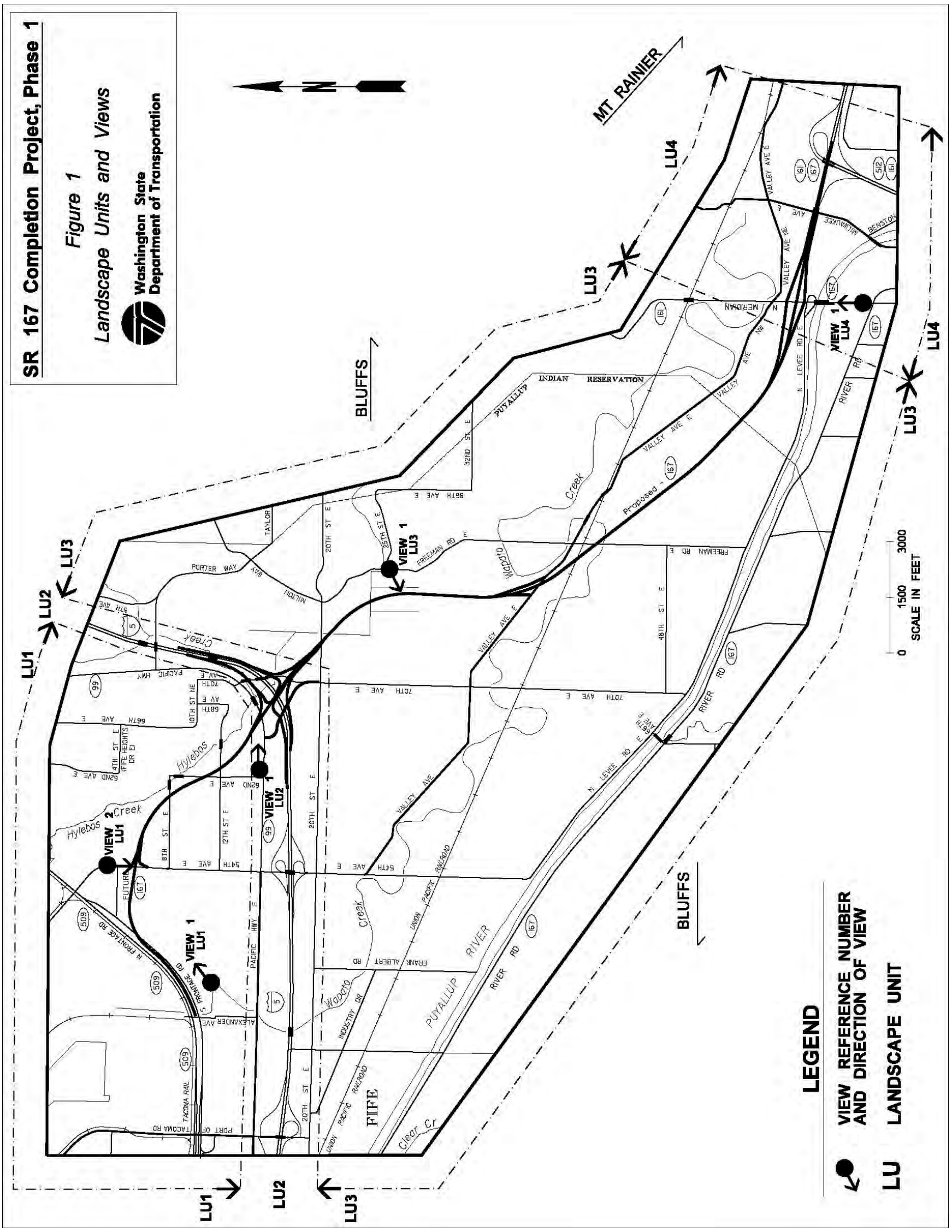
Landscape Units

The 2006 FEIS described four distinct landscape units, LU1 – LU4. Figure 3.9-1 from the 2006 FEIS shows the boundaries of the landscape units, and is reproduced below for reference. The 2006 FEIS also identified the visual resources and key views within each landscape unit. The quality of the key views were rated for existing (2006) and proposed (Build Alternative) conditions.

Since completion of the Tier II FEIS in 2006, a number of characteristics changed within the project corridor. These included increase in vacant land development, Port of Tacoma expansion, and Tribal property acquisition expansion. The four Landscape Units and the Key Views that were applicable to the 2006 Tier II FEIS remain applicable to the Phase 1 Improvements (see Figure 1) and compare as follows:



LANDSCAPE UNITS AND VIEWS FIGURE 3.9-1 FROM THE 2006 FEIS



LANDSCAPE UNITS AND VIEWS FIGURE 1 FOR THE PROPOSED PHASE 1 IMPROVEMENTS

Comparison of Landscape Units and Key Views for 2006 FEIS and proposed Phase 1 Improvements

Landscape Unit 1 – (SR 509 to SR 99)

2006 FEIS: Commercial and industrial areas that are primarily Port of Tacoma related. One- and two-story warehousing buildings, rail facilities, storage facilities, and related construction; overhead lighting and power lines; the areas of proposed SR 167/SR 509 connection mainly under developed or sparely developed. Open spaces are dominated with scotch broom and grasses; views of the bluffs to the north are unobstructed due to few large trees; views of downtown Tacoma area are available to west. This LU also includes the residential area located on the bluff. From the bluff, views of the port, downtown Tacoma, and valley have shown the transition from farmlands to commercial development. The bluffs are heavily vegetated with indigenous trees and shrubs. Due to the amount of existing manmade elements, including structures and other roads, this LU already ranks low in intactness.

KEY VIEW 1 – Looking Northeast. Vicinity of Alexander Ave and SR 167/509 Interchange: Open view across field dominated by grasses. Bluff and Mount Rainier visible with Port of Tacoma, some commercial buildings to the north and south.

KEY VIEW 2 – Looking South. Disjointed with manmade elements including commercial buildings, residential houses, power lines, signs, luminaries, etc.

Proposed Phase 1 Improvements: Transition from agricultural use to industrial and commercial development has continued at a rapid pace. Other than the bluffs, most of the open land is developed, or being developed. A few residential areas remain, scattered between the warehouses and commercial buildings and parking lots. As commercial buildings and warehouses have moved in, some streets have been landscaped with trees, blocking the large structures, but also blocking the more expansive views of the bluff and Mount Rainier.

KEY VIEW 1 – Looking Northeast. Vicinity of Alexander Ave and SR 167/509 Interchange: Open view across field dominated by grasses and Scotch broom. Bluff and Mount Rainier visible with Port of Tacoma, some commercial buildings to the north and south and street trees planted on south side of SR 509.



UPDATED LANDSCAPE UNIT 1, KEY VIEW 1: Vicinity of Alexander Avenue and proposed SR 167/509 Interchange, looking northeast. This view currently remains open with views of the bluffs.

KEY VIEW 2 – Looking South. This view has remained disjointed. Some structures and trees have been removed, while some volunteer indigenous trees, Scotch broom and blackberries have established in the vacant lots.



UPDATED LANDSCAPE UNIT 1, KEY VIEW 2: 54th Avenue East and 4th Street, looking south. This view remains mostly commercial with some vacant lots.

Landscape Unit 2 – (I-5 Vicinity)

2006 FEIS: This Landscape Unit encompasses the commercial areas along Pacific Highway East and I-5 between the 54th/I-5 Interchange and the King County Line. Just north of the proposed SR 167/I-5 Interchange and west of SR 99 is the transitional area between commercial establishments and rural residential areas. The area is bordered along the northwest side by a bluff vegetated with a mixture of coniferous and deciduous trees and shrubs on the steep slopes rendering it unsuitable for building. Overhead power lines, lights and billboard signs are dominant as is I-5. The area is disjointed, and ranks low in vividness, intactness, and unity.

KEY VIEW 1 – Looking East. Lacking continuity, unity memorability, with manmade elements encroaching into the views of the valley and bluffs.

Proposed Phase 1 Improvements: Conditions in this LU remain the same as documented in the 2006 FEIS. Some previous buildings and businesses are now vacant lots.

KEY VIEW 1 – Looking East. This view remains similar to the conditions described in the 2006 FEIS, with the exception of former businesses replaced by empty lots.



UPDATED LANDSCAPE UNIT 2, KEY VIEW 1: SR 99 (Pacific Avenue) looking east. Some former businesses replaced by vacant lots.

Landscape Unit 3 – (I-5 to SR 161)

2006 FEIS: This Landscape Unit is located on the south side of I-5, and has some commercial and industrial complexes but is still primarily rural farm area. The majority of the area is flat agricultural land bounded by heavily vegetated bluffs on the east and west sides borders of the study area. Mount Rainier can be seen in the distance. In the vicinity of the Milwaukee Avenue and the existing SR 167 interchange the area is highly developed with commercial and retail businesses.

KEY VIEW 1 – Freeman Road East looking west. Views of agricultural fields. Intactness and unity are high across the valley.

Proposed Phase 1 Improvements: Significant increase in commercial and industrial complexes, and large 2-story warehouses have degraded most of the agricultural feel of the valley.

KEY VIEW 1 – Freeman Road East looking west. Most views across the valley are limited with large warehouse buildings, commercial and industrial complexes blocking them. Intactness and unity are now low.



UPDATED LANDSCAPE UNIT 3, KEY VIEW 1: Freeman Road East, looking southwest. This view is a few blocks north of the original photograph in the 2006 FEIS. The view from the original location is completely blocked by a multi-story warehouse.

Landscape Unit 4 – (SR 161 to SR 512)

2006 FEIS: This Landscape Unit is in the vicinity of the existing SR 167/SR 512 Interchange. Views of the Puyallup River are limited to the bridge crossing area. Views of the river are limited because of the containment levee. Vegetation and buildings block most of the views of the river.

The vicinity of Milwaukee Avenue and the existing SR 167 Interchange is highly developed with commercial and retail businesses. Advertisement signs, overhead power lines and luminaries are present. The SR 167/SR 512 Interchange is a large scale and dominating entity. This LU ranks low in intactness.

KEY VIEW 1 – Vicinity of North Meridian and North Levee Road East looking north. Existing SR 167 ramps/freeway and the numerous manmade elements in the urban business complex area of North Meridian.

Proposed Phase 1 Improvements: Conditions in this LU remain the same as documented in the 2006 FEIS.

KEY VIEW 1 – This view remains similar to the conditions described in the 2006 FEIS.



UPDATED LANDSCAPE UNIT 4, KEY VIEW 1: North Meridian, looking north.

4. Would the Phase 1 Improvements result in any new or significant impacts?

For this 2018 analysis, the visual quality impacts of the proposed SR 167 Phase 1 Improvements were reviewed and compared to the 2006 FEIS Build Alternative impacts. Impacts include effects associated with the Phase 1 alignment right of way as well as the impacts associated with the Riparian Restoration Program (RRP) areas and potential wetland mitigation sites.

The analysis found that the proposed SR 167 Phase 1 Improvements result in limited change to the amount of visual impacts that will occur as compared to the 2006 FEIS Build Alternative.

The visual impacts in the four Landscape Units described in the 2006 Tier FEIS remain applicable to the Phase 1 Improvements, and compare as follows:

Landscape Unit 1 – (SR 509 to SR 99)

2006 FEIS: The 2006 Build Alternative alignment planned to build on a raised embankment throughout most of this Landscape Unit. The visual line element would be dominant and lessen the overall vividness in the unit. Certain locations on the elevated roadway would provide views of Commencement Bay, the bluffs, the Port of Tacoma area, and Mount Rainier. Lighting from the structure and from headlights would alter the viewshed at night with an overall negative visual impact.

Proposed Phase 1 Improvements: The new proposed Phase 1 Improvements would still be built on a raised embankment. The visual impacts are anticipated to be similar to those described in the 2006 FEIS.

Landscape Unit 2 – (I-5 Vicinity)

2006 FEIS: The 2006 Build Alternative ramps and structures would create substantial negative visual impacts in the area. The three levels of new elevated roadway would block views from nearby hillside homes. The new structures would create a negative visual impact due to increased mass and scale.

Views from I-5 would also be negatively impacted with vistas curtailed by the new structures creating a shaded, concrete canopy over the interstate through the proposed interchange.

Proposed Phase 1 Improvements: The new Phase 1 Improvements would include a Diverging Diamond Interchange. This will reduce the three levels of overpass (described in the 2006 FEIS) to one level, minimizing the visual impact significantly. Views from nearby hillside homes and I-5 will still have negative visual impacts due to the raised embankment and overpasses. However the new visual line element will lessen (reduce) the overall impact to vividness, intactness, and unity compared to the 2006 Build Alternative.

Landscape Unit 3 – (I-5 to SR 161)

2006 FEIS: The 2006 Build Alternative alignment planned to build on a raised embankment throughout this Landscape Unit. This visual line element would dominate and lessen the overall vividness. The embanked roadway would be visible from many parts of the relatively flat and open-space viewshed. Night-time vehicle lights, plus roadway luminaries, would have also created negative impacts in this less developed LU. The preferred alternative interchange option at Valley Road would have negative visual impacts due to an increased footprint along the corridor.

Proposed Phase 1 Improvements: This alignment will still be built on a raised embankment throughout this Landscape Unit and will still be the dominant, linear feature in this viewshed. However, the viewshed is no longer flat because it is currently (as of 2018) dominated with large warehouse buildings, commercial and industrial complexes, and the increased industrial character have already created negative impacts to the shrinking agricultural viewshed. The proposed Phase 1 interchange at Valley Avenue has a smaller footprint than the 2006 Build Alternative, and will have a smaller impact than the 2006 Build Alternative, but the proposed improvements will still add to traffic with increased nighttime vehicle lights, and roadway luminaires, and will add to the negative impacts that have been increasing in this Landscape Unit. The addition of the raised roadway with interchange ramps will alter the compositional visual pattern and have an overall negative impact however, the lines of the roadway will provide a sense of continuity along the valley floor.

Landscape Unit 4 – (SR 161 to SR 512)

2006 FEIS: The 2006 Build Alternative planned to be built on a raised embankment throughout this Landscape Unit. The new visual line element will be dominant and will lessen the overall vividness in the unit. However, due to the amount of existing manmade elements, including structures and other roads, this Landscape Unit ranks low in intactness. Visual unity will be negatively impacted as the addition of the wide, raised roadway with interchange ramps will substantially alter the compositional visual pattern. The lines of the roadway will also provide a sense of continuity along the valley floor in this Landscape Unit as well.

Proposed Phase 1 Improvements: The new proposed Phase 1 Improvements would still be built on a raised embankment. The visual impacts are expected to be similar to those described in the 2006 FEIS.

While increased man-made impacts since 2006 have lead to the current degradation of the proposed SR 167 Phase 1 corridor, the elevation, scale, and length of the project will dominate this area of the valley. The elevated embankment will give the appearance of a levee running through the corridor, creating a visual barrier dividing the valley. As with any roadway, lights and glare associated with a new highway at night will also create an additional negative impact to all LU's in the current alignment.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Mitigation during operations for the 2006 FEIS Build Alternative refer to the "Roadside Classification Plan" (WSDOT 1996) as a guideline for roadside restoration and mitigation for the project. This involves blending architectural elements with the roadway structures, minimizing the use of luminaires and using low lighting to lessen the impact from glare, using wall fencing or vegetation to screen car movement on the roadway and glare. Vegetation is recommended in many areas to bring the roadway and its structures to a human scale, screen for glare, and soften views away from and towards the dominant linear element within the landscape.

The Roadside Classification Plan has been replaced with the "Roadside Policy Manual" (WSDOT, August 2015), and the Roadside Manual. Mitigation treatment for visual impacts in the Roadside Policy Manual and the Roadside Manual is the same as mitigation treatment in the Roadside Classification Plan. Therefore mitigation during operations for the proposed Phase 1 Improvements would be consistent with what was described in the 2006 FEIS, Section 3.9.4 (page 3-257) with some changes in the planting palate for the areas considered "Urban" per the Roadside Policy Manual. These changes include reducing the amount of shrubs and groundcovers planted within the proposed planting areas and replacing them with native grasses. It is WSDOT Policy to remove the minimum amount of desirable vegetation necessary to complete the project. It is also WSDOT policy to replace trees removed by a project at various replacement ratios based upon diameter of trunk at breast height (dbh) removed. Replanting with trees will still be a component of the roadside restoration within "Urban" areas and the entire corridor.

One goal of the updated planting scheme for the Phase 1 Improvements is to address increased homeless encampment pressures that urban areas in the State of Washington are currently encountering. Planting these areas with shrubs and groundcovers would provide visual screens that serve as hiding places for homeless camps and/or illegal activities to occur in many instances. The new planting plan to include more native grasses mixed with trees versus shrubs and groundcovers is anticipated to minimize this problem.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

Consistent with the discussion in Section 3.9.3 (page 3-247) of the 2006 FEIS, visual impacts of construction under the proposed Phase 1 Improvements are considered temporary in nature, therefore only impacts during operations phase are considered.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Consistent with the discussion in Section 3.9.3 of the 2006 FEIS, visual impacts of construction under the proposed Phase 1 Improvements are considered temporary in nature, therefore only impacts during operation are considered.

8. Conclusion

The impacts from the new proposed SR 167 Phase 1 Improvements are consistent with, or reduced compared to the extent of impacts identified in the 2006 FEIS. No additional adverse effects will result from the Phase 1 alignment and design features. WSDOT will plant native vegetation along the proposed Phase 1 alignment corridor and interchanges consistent with the WSDOT Roadside Policy Manual to blend the

new project alignment and interchanges into the existing landscape, while enhancing the natural harmony, cultural order, and project coherence.

The alignment for Phase 1 Improvements decrease the amount of native vegetation to be impacted as compared to the impacts documented in the 2006 FEIS. This change in impact to existing vegetation will reduce the amount of re-planting and plant establishment associated with the project in various locations along the alignment. The SR 167 Phase 1 Project will not result in any new significant adverse impacts compared to the 2006 Build Alternative.

References

Washington State Department of Transportation – Roadside Classification Plan. 1996, Out of print, no longer available.

Washington State Department of Transportation - Roadside Policy Manual. Publication M 3110.03, August 2015. https://www.wsdot.wa.gov/publications/manuals/fulltext/M3110/RPM.pdf

Washington State Department of Transportation – Roadside Manual. Publication M 25-30.04. October 2017. http://www.wsdot.wa.gov/publications/manuals/fulltext/M25-30/Roadside.pdf

Washington State Department of Transportation - SR 167 Puyallup to SR 509 *FINAL* Visual Quality Report, October 2001. Ken Schlatter, Olympic Region.

U.S. Department of Transportation, Federal Highway Administration publication "Visual Impact Assessment for Highway Projects," March 1988. http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

U.S. Department of Transportation, Federal Highway Administration publication, "Guidelines for the Visual Impact Assessment of Highway Projects," January 2015. Document No. FHWA-HEP-15-029. https://www.environment.fhwa.dot.gov/env_topics/other_topics/VIA_Guidelines_for_Highway_Projects.aspx

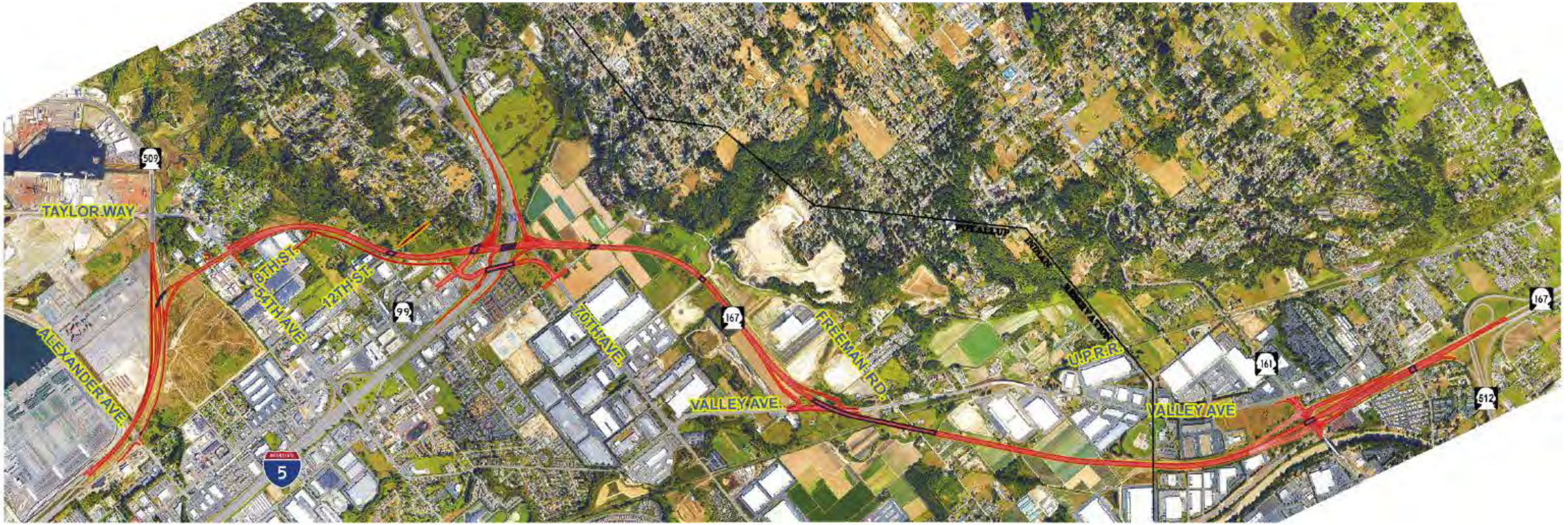
Federal Highway Administration and Washington State Department of Transportation - SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation (November 2006), Chapter 3.9 Visual Quality.

Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – SR 167 Phase 1 Improvements


TAYLOR WAY
ALEXANDER AVE.
8TH ST.
54TH AVE
12TH ST.
99
70TH AVE.
167
VALLEY AVE.
FREEMAN RD.
U.P.R.R.
VALLEY AVE
161
512
5
509

Public Services

COPY TO:	**Project File**
PREPARED BY:	**Hussein Rehmat, Environmental Planner, HNTB**
DATE:	**January 26, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the Washington State Department of Transportation (WSDOT) Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to public services.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design.

The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed

SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

This 2017 re-evaluation examines changes to the existing public services from what was described in Section 3.10.2 of the 2006 FEIS. The study area evaluated for this memorandum included one mile on either side of the center-line of the Phase 1 Improvements alignment and is shown in Figures 1 through 3. This roughly approximated the study area described in the 2006 FEIS which encompassed the City of Fife, the northernmost portions of the City of Puyallup, and instances where service boundaries overlap with surrounding communities. The public services reviewed include education, government and social institutions (including churches, community centers, day care facilities, and social service providers), medical services (including hospitals, medical and dental clinics, and nursing homes), fire and police stations, cemeteries, and recreation using 2017 Google Maps information and mapping information from the cities, county, and school districts. Since 2017 information was used, several new public services were identified which had not previously been identified in the 2006 FEIS including a private school, Puyallup City Hall, food bank, medical and dental clinics, and nursing homes. All the most recent public services in the study area are described in the sections below.

Educational Facilities and Attendance Boundaries

Fife School District

The Fife School District boundaries are the same as described in the 2006 FEIS. Attendance boundaries cover 10 square miles and extend as far south as North Levee Road East, to the north encompassing Fife Heights, to Hedden Elementary School east of SR 161 (North Meridian), and as far west as the Tacoma city limits. The District continues to serve the Cities of Fife, Milton, and a portion of Edgewood. The district also includes the unincorporated areas of Trout Lake, Jovita, Fife Heights, and a portion of the Port of Tacoma. No new schools have been constructed since the 2006 FEIS, however, enrollment has increased from 3,200 students to approximately 3,500 students. As shown in Figures 1 and 2, the proposed SR 167 Completion Project bisects the school district boundary.

In 2006, approximately 12 buses provided school transportation on 20 routes throughout the district. As of 2017, bus transportation has increased with approximately 23 buses on 60 routes. Buses provide both morning and afternoon transportation to the elementary, middle, and high school students using many of the local arterials in the study area. Consistent with the 2006 FEIS, 54th Avenue East, North Levee Road, 70th Avenue East and 20th Street East are the primary school bus routes through the Fife valley. The majority of school bus trips occur on 20th Street East, as this street is the most widely used corridor connecting the eastern and western halves of the school district.

Puyallup School District

As described in the 2006 FEIS, the Puyallup School District serves the Cities of Puyallup and Edgewood while sharing most of its northern boundary with the Fife School District. The Puyallup School District's southern boundary extends as far south as 191st Street East, as far west as Walker Road East, and as far east as the Puyallup city limits. Of the district's 32 schools serving more than 22,500 students, four are located within the study area (see Figure 1 through Figure 3). A fifth Puyallup school, Hilltop Elementary, was included in the 2006 FEIS study area; however, this school has since closed. As discussed in the 2006 FEIS, the primary bus routes within the study area include Valley Avenue, Freeman Road East, 24th Street East and SR 161 (Meridian Avenue).

Other Educational Facilities

In addition to the Fife and Puyallup School District, since the 2006 FEIS, there is one new private school in the study area. The Fife campus of the All Saints Catholic School is located at 2323 54th Avenue East (see Figure 2). At this campus the school provides pre-school through 2nd grade education.

Government and Social Institutions

Government and social institutions in the study area are shown in Figure 1 through Figure 3 and described below.

Government facilities

Government facilities located within the study area include the Fife City Hall (5411-23rd Street East), the Milton City Hall (1000 Laurel Street), and the Puyallup City Hall (333 S Meridian). Fife City Hall was the only government facility identified previously in the 2006 FEIS study area. The Milton City Hall may not have been identified within the 2006 FEIS because it is located outside of the previous study area boundaries and the Puyallup City Hall was not identified because it was not constructed until after completion of the 2006 FEIS.

Churches

No churches were identified in the 2006 FEIS. Five churches are currently located in the study area, these include:

- New Horizon Christian Center, located at 5600 Valley Avenue East
- St Martin of Tours Parish, located at 2303 54th Avenue East
- St Paul Chong Hasang Parish, located at 1316 62nd Avenue East
- Seed of Life Baptist Church, located at 6905 10th Street East
- Christ Episcopal Church, located at 210 5th Street SW

Community Centers

The Fife Senior/Community Center (located at 2111 54th Avenue East) and the Puyallup Recreation Center (located at 800 Valley Avenue Northwest) are the two community centers located in the study area. As described in the 2006 FEIS, as of 2017, services at the Fife Senior/Community Center include classes, a swimming pool, health screening, seminars, and social functions.

As described in the 2006 FEIS, the City of Puyallup operates a recreation center. The center is a multi-use facility with small meeting rooms, a dance area, full size gymnasium, and a large workout area. The center hosts a variety of classes, programs, and social functions. As part of the recreational center there are also outdoor fields and tennis courts.

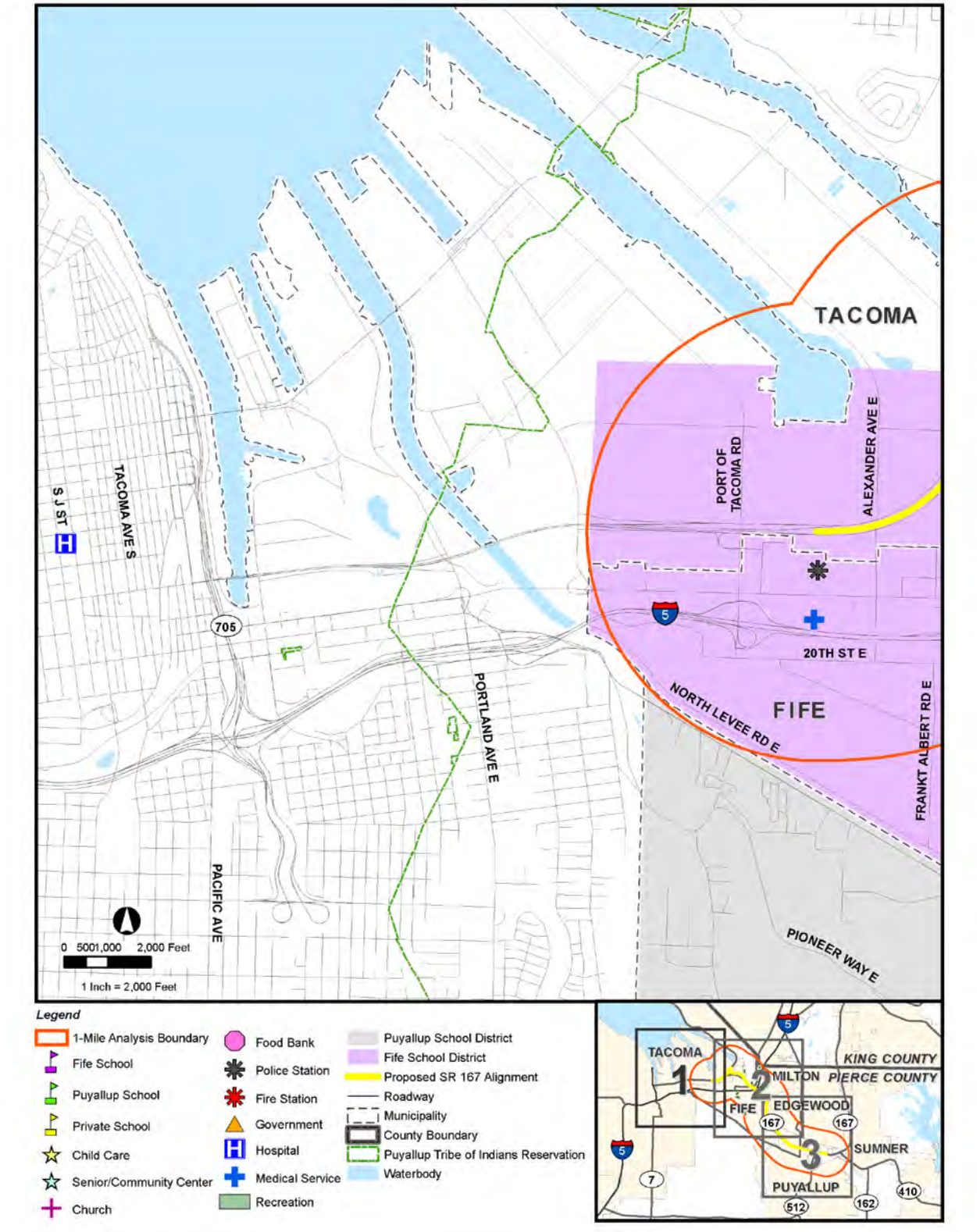


Figure 1. Map of Public Services (Map 1 of 3)

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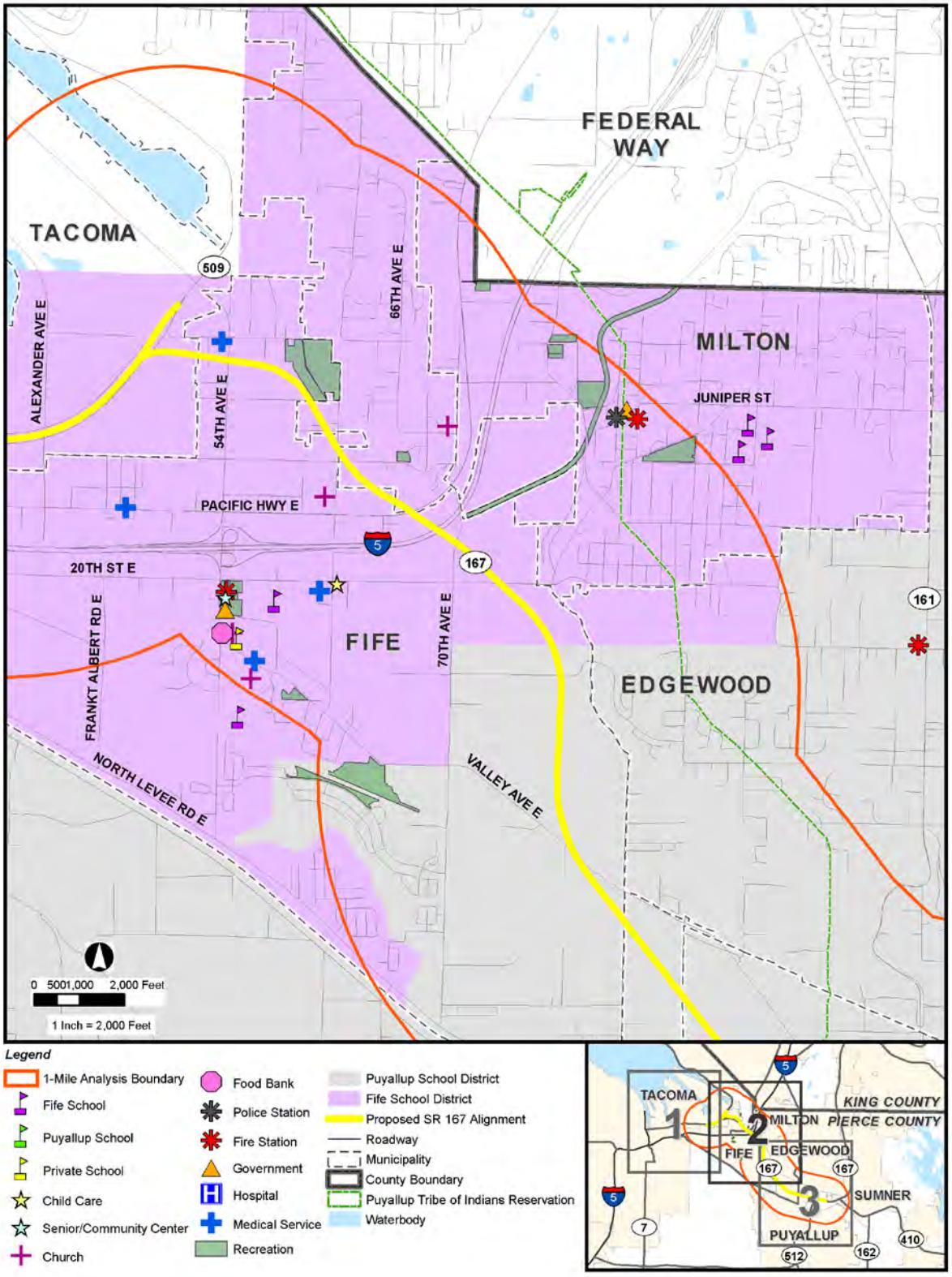

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138 Figure 2. Map of Public Services (Map 2 of 3)
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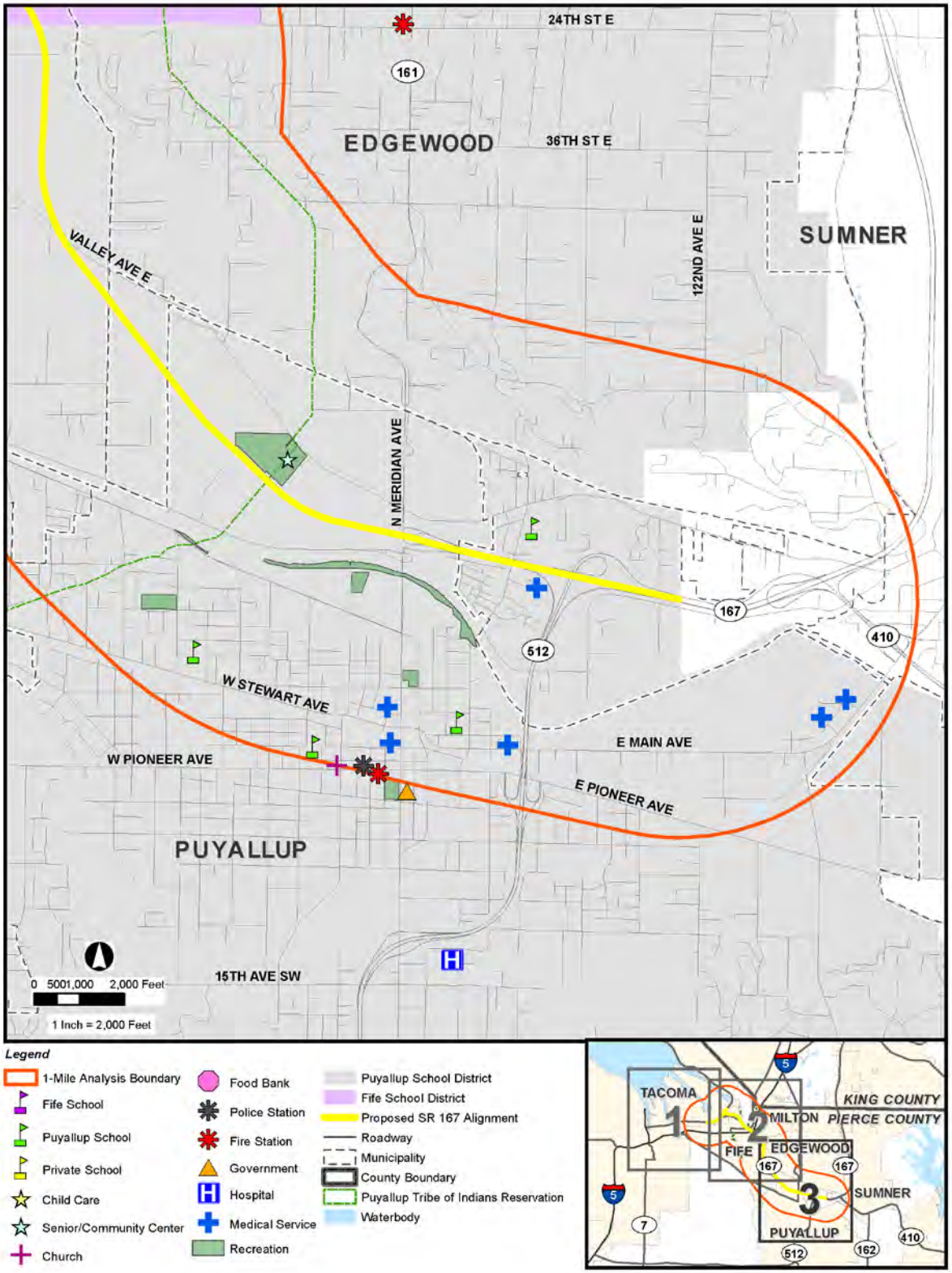

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Figure 3. Map of Public Services (Map 3 of 3)

Day Care Facilities

No day care facilities were identified the 2006 FEIS for the study area. Munchkinland Child Care, located at 6205 20th Street East, is the only day care facility located in the study area evaluated in 2017. The facility provides child care to Fife, Milton, and the surrounding communities.

Social Service Providers

The only social services provider in the study area is the Fife Milton Food Bank (which was not identified in the 2006 FEIS), located at 2303 54th Avenue East. The food bank is operated by the St Martin of Tours Parish.

Medical Services

As stated in the 2006 FEIS, major medical facilities that service the study area include St. Joseph's Medical Center in Tacoma and MultiCare Good Samaritan Hospital in Puyallup (see Figures 1 and 3). Additional medical clinics in the study area include:

- MultiCare Centers for Occupational Medicine, located at 502 54th Avenue East in Fife: providing occupational injury and illness care; employment physicals and screening; drug and alcohol testing; and immunity services.
- Occupational Medical Clinic of Tacoma, located at 4703 Pacific Highway East in Fife: providing occupational injury and illness care; employment physicals and screening; drug and alcohol testing; and immunity services.
- Salish Cancer Center, located at 3700 Pacific Highway East in Fife: a cancer treatment center providing medical oncology, naturopathic oncology, native healing, Chinese medicine, care coordination, and a medical dispensary.
- Dove Medical Clinic, located at 801 E Main Avenue in Puyallup: providing a wide range of medical services and testing.

No dental clinics were identified in the 2006 FEIS. The following dental clinics are located with the study area and shown in Figures 1 through 3:

- FME Family Dental, located at 6104 20th Street East in Fife
- Distinctive Dentistry, located at 5615 Valley Avenue East in Fife
- Puyallup Valley Dental Care, located at 2921 5th Avenue NE in Puyallup
- Northwest Dental Medicine, located at 2903 E Main in Puyallup
- Main Station Dental Care, located at 111 W Main in Puyallup

No nursing homes were identified in the 2006 FEIS. There are three nursing home facilities located within the study area in Puyallup and include the Brookdale Puyallup (123 4th Avenue NW), Linden Grove Health Center (400 29th Street NE), and a private nursing home type facility located on Morningside Drive adjacent to the onramp to SR 512. The location of these facilities are shown on Figure 3.

Fire and Police

Firefighting/Emergency Services

Most of the fire suppression and emergency medical services in the study area are provided by the Tacoma Fire Department, since there is a service agreement between them and the City of Fife. As identified in the 2006 FEIS, the Tacoma Fire Station No. 12 located at 2015 54th Avenue East serves the study area. The Puyallup portion of the study area is served by Central Pierce Fire and Rescue shown on Figure 3, while the cities of Milton and Edgewood are served by East Pierce Fire and Rescue (Figures 2 and 3), The average response time for calls within the service area is about 6-7 minutes as compared to the 4-6 minutes identified in the 2006 FEIS (Tacoma Fire Department 2016 & Central Pierce Fire & Rescue 2014).

Police

As stated in the 2006 FEIS, the major portion of the study area is served by the Fife Police Department. The department maintains coverage for the entire area bounded by the Fife city limits. The Fife police department is located at 3737 Pacific Highway E in the study area and shown on Figure 1.

The Puyallup Police Department (311 W Pioneer Avenue, Figure 3) serves a small segment of the southern section of the study area. The Milton Police department (1000 Laurel Street, Figure2) serves the City of Milton while the Pierce County Sheriff's department serves the City of Edgewood as well as unincorporated Pierce County.

Recreation

The parks and recreation facilities in the study area are (see Figures 1, 2, and 3) listed below by city. Those facilities not identified in the 2006 FEIS are also noted below.

City of Fife

- Fife community swimming pool: located at 20th Street East and 54th Avenue East.
- Fife High School: provides recreational opportunities for community residents during after-school hours and in the summer.
- Fountain Memorial Park: A small gateway park located at the intersection of 54th Avenue East and 20th Street East.
- Colburn Park (not identified in 2006 FEIS): A 1.46-acre neighborhood park facility located adjacent to the Fife Swim Center on 20th Street East.
- Centennial Park: A small park facility located adjacent to the Fife City Hall on 23rd Street East.
- Dacca Park: An 18-acre community park which includes sports fields and off leash dog park is located adjacent to the Columbia Junior High School on 54th Avenue East.
- Wedge Park: A 2.35-acre park located between Wapato Creek and Valley Avenue which includes passive and active recreational facilities.
- 5-Acre Park (not identified in 2006 FEIS): A 5.3-acre neighborhood park that stretches along Radiance Road, immediately south of the railroad tracks, in a linear fashion and is connected by a paved trail. The park offers walking trails, a playground, and other recreational facilities.
- Brookville Gardens Community Park: A 9.6-acre future community park with complementary adjoining 4.4-acre open space located along the banks of Wapato Creek and south of Valley

Avenue East. This park is planned to contain open play areas, playgrounds, and picnic areas. The park is planned to open in the fall of 2017.

- Hylebos and Milgard Nature Areas (Milgard Nature Area was not identified in the 2006 FEIS): A 25.5 acre site along Hylebos Creek which has been developed into an important habitat restoration project. The City operates and maintain the parks with the help of volunteer groups. The parks are accessible via a trailhead located at the dead end of 4th Street East or a small parking area at the corner of 62nd Avenue East and 8th Street East.

The City of Fife's proposed National Soccer Park that was identified in the 2006 FEIS to be located within the study area was terminated in 2007.

City of Puyallup

- City of Puyallup recreation center, located at 800 Valley Avenue Northwest described in the community centers section above: As part of the recreational center there are also outdoor fields and tennis courts. Sam Peach Park, located at 1621 10th Avenue NW: The park features baseball/softball field, grassy area, playground, and walking track.
- Grayland Park (not identified in 2006 FEIS), located at 601 N Meridian: This 3-acre neighborhood park is located adjacent to the Memorial Center, and includes a playground and picnic area.
- Puyallup Skatepark (not identified in 2006 FEIS), located at 1299 4th Street NW: A 10,000 square foot skatepark for skateboards, rollerblades, and bicycles. The park also includes spectator seating.
- Puyallup Riverwalk Trail (not identified in 2006 FEIS), located at 3211 East Main: This approximately 5-mile trail runs along the Puyallup River expect for about one mile where existing sidewalks serve as the trail.

City of Milton

- Milton Community Park (not identified in 2006 FEIS), located at Milton Way and 15th Avenue: This 10-acre park includes ball fields, picnic grounds, tennis courts, children's play area, and Veterans Memorial.
- Interurban Trail, located at 70th Avenue: The Interurban railway right-of-way is a notable scenic route that meanders through the City of Milton from 70th Ave in Pierce County through Military Road in King County. The trail right-of-way is 100 feet wide and includes significant stands of coniferous trees and several areas of distinctive natural features, including the East Branch of Hylebos Creek, known as Sweetwater Creek.
- West Milton Nature Preserve (not identified in 2006 FEIS), located at 604 5th Avenue: This property is a Nature Preserve. Including the east branch of the Hylebos Creek, known as Sweetwater Creek, and its associated wetlands, the park is focused on the rehabilitation of salmon and trout populations.

4. Would the Phase 1 Improvements result in any new or significant impacts?

WSDOT's proposed Phase 1 Improvements would not result in any new or significant impacts beyond those discussed for the 2006 FEIS Build Alternative. No community facilities would be displaced as a result of Phase 1 Improvements. Changes in access are not expected to affect any public services. A

more detailed discussion regarding changes in access are included in the Land Use and Socioeconomics Technical Memorandum.

Once the construction of the Phase 1 Improvements are complete, school buses, police, fire, and emergency vehicles will be provided with an additional route option in providing services. In addition, the project would reduce traffic, including freight truck traffic on local roads. As indicated in Table 2, 54th Avenue East, Valley Avenue East, and River Road will experience a decrease in traffic volumes. With less heavy industrial traffic on local arterials, historically congested streets will no longer impede emergency vehicles or access to and from public services and recreational facilities. It is anticipated that access will improve and travel times are expected to decrease in the project area compared to current conditions. Emergency service response times to residential areas are also expected to improve.

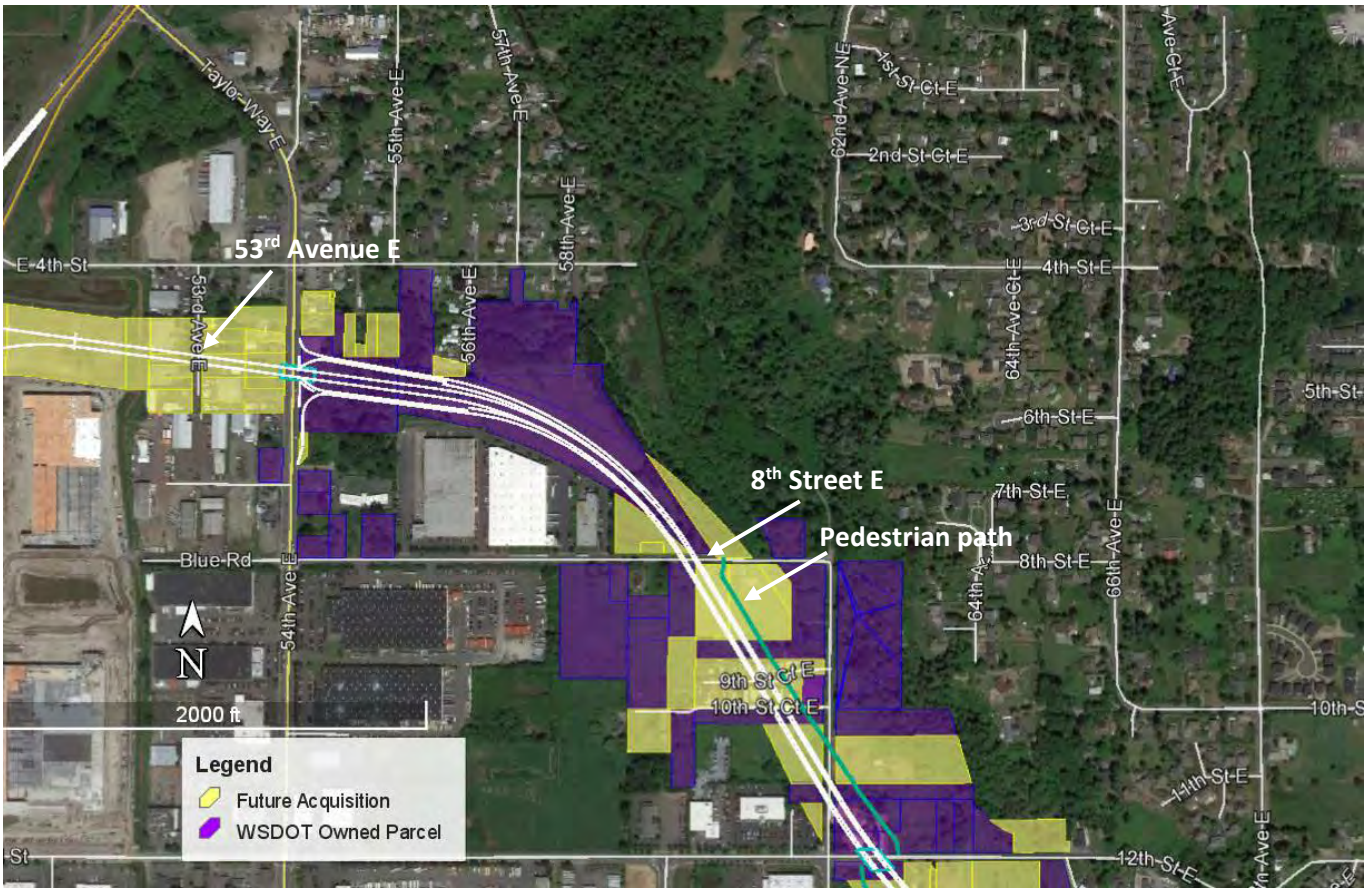
Table 2. Comparison of Average Daily Traffic on Key Roadways within the Study Area

Roadway	2045 No Build (both directions)		2045 Build (both directions)	
	AM Peak	PM Peak	AM Peak	PM Peak
54th Avenue E (south of 20th Street E)	1790	1540	1040	980
20th Street E (east of 54th Avenue E)	1640	1670	1040	800
Pacific Highway (SR 99) (west of 54th Avenue E)	1680	2400	980	1570
Valley Avenue E (west of 70th Avenue)	1610	1390	870	970
River Road (SR 167) (east of 30th Avenue E)	1920	1960	1570	1600

Source: SR 167 Transportation Discipline Report

Although the proposed new SR 167 freeway will bisect service areas, there is no anticipated need to change any service area boundaries or provide additional facilities. The SR 167 Phase 1 Improvements will not result in any major arterial closures as the new freeway will bridge over all major arterials that it would cross. A few local access roadways, however, would be eliminated or cul-de-saced. These smaller roads are: 53rd Avenue East, 8th St. E, 9th Street Court E, 10th Street Ct E, 62nd Avenue E, 65th Avenue. E., and 67th Avenue E. These roadways currently provide access to land that is either WSDOT owned or anticipated to be acquired by WSDOT for ROW.

Two streets, 53rd Avenue East and 8th Street East, will be shortened and a cul-de-sac provided for turnaround. As shown in Figure 4, 53rd Avenue East is a dead-end street and several of the businesses along it would be acquired as part of the project. As it currently exists, 8th Street East connects with 62nd Avenue East; however, once Phase 1 Improvements are constructed, 62nd Avenue East will no longer exist north of 12th Street East. Both 65th Avenue and 67th Avenue are currently dead end streets. Both of these streets will be eliminated with the project as all the surrounding property will be purchased for the project. There are no public services located along these roadways.



Source: Google Earth 2017

Figure 4. Location of 53rd Ave East and 8th Street East in Study Area

Currently there is also a roadway bridge over Hylebos Creek on 8th Street East, which pedestrians use to make a loop on the Hylebos Creek Nature trail and the Milgard Nature trail. The project will remove that roadway bridge and replace it with a pedestrian bridge so that the loop is maintained.

As shown in Figure 5, the proposed new SR 167 freeway would be located within 100-feet of the Puyallup Recreation Center. A small strip of land may be acquired from the 18-acre recreation center. The acquisition would occur in an area that is not currently used for recreation purposes and would not affect the use on the remaining land. No other direct effects on recreational facilities is anticipated as a result of the Phase 1 Improvements. Additional information on recreational facilities is provided in the Section 4(f) Technical Memorandum.



Source: Google Earth 2017

Figure 5. Puyallup Recreation Center

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Similar to the 2006 FEIS Build Alternative, no mitigation measures are proposed or necessary during the operation phase of the Phase 1 Improvements.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The effects of the proposed Phase 1 Improvements on public services during construction are consistent with what was described for the 2006 FEIS Build Alternative. There are no public facilities such as hospitals, schools, and police departments located within the project corridor nor would any public facilities be separated from the community they serve by the project. Access to these facilities and their services will not be halted by construction, however use of alternative routes may be necessary during periods of construction. Rerouting and disruptions in access could temporarily impact emergency service providers such as ambulance, police, and fire protection, as well as school bus routes especially when traveling through construction areas.

A small sliver of land may be acquired from the Puyallup Recreation Center. Mitigation measures for this acquisition are discussed in the Section 4(f) Technical Memorandum. No other recreational facilities will be permanently impacted from the construction of the project. Some existing facilities will be

temporarily impacted due to traffic control and road closures. Once the project is completed, traffic patterns will re-establish themselves based on the revised road system.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Mitigation measures during construction of the proposed Phase 1 Improvements are consistent with those described for the 2006 FEIS Build Alternative. Impacts to fire, emergency, and police services during construction will be limited to temporary disruptions of service routes within the construction zone. Service providers affected by construction will be notified in advance of the construction period. Police, fire and emergency response, school districts, and educational facilities will be notified of construction schedules, access restrictions and possible detour routes prior to access modification.

The scheduling of road closures and detour routes will be coordinated with police fire, and emergency services, school districts, educational facilities, and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will conform to state and local regulations. Restricting lane closures and construction activities that impact traffic during peak commuter hours and peak holiday travel periods will help minimize backups and delay times. WSDOT will maintain open communications to help keep local residents informed of development phase, areas of construction, and possible travel alternatives.

8. Conclusion

Consistent with the mitigation measures in Section 3.10.6 of the 2006 FEIS, no new significant impacts to public services from construction and operation would occur as a result of the proposed Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures are necessary or would be required.

References

City of Fife, 2017. http://cityoffife.org/

City of Fife Parks and Recreation, 2017. https://cityoffife.maps.arcgis.com/apps/MapTour/index.html?appid=0c6a6e8394574f098fab261e397d574f

City of Puyallup Parks & Recreation, 2017. https://www.cityofpuyallup.org/248/Parks-Recreation

Central Pierce County Fire & Rescue, 2014. *2014 Annual Report.* Pierce County, Washington

East Pierce Fire & Rescue, 2017. https://www.eastpiercefire.org/

Fife Public Schools, 2017. http://www.fifeschools.com/home

"Public Services." 47°13'19.56" N and 122°19'32.36 W. GOOGLE EARTH. May 22, 2017. September 2017.

Puyallup School District, 2017. https://www.puyallup.k12.wa.us/

Tacoma Fire Department, 2017. https://www.cityoftacoma.org/government/city_departments/fire/.

WSDOT 2006, SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation. Chapter 3.10 - Public Services and Utilities.

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Attachments

Attachment A--2006 Build Alternative



Attachment B-- Phase 1 Vicinity Map



Utilities

COPY TO:	**Project File**
PREPARED BY:	**Gordon Nelson, David Evans and Associates, Inc.**
DATE:	**December 18, 2017**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to utilities.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

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Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue undercrossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue East. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 - Comparison of Design Components for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). In addition, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange	Full SPUI	Full SPUI

(Meridian Avenue)		(Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

This technical memorandum addresses public and privately owned utilities, including electric, natural gas and other fuels, telecommunications, water, sewer, stormwater, and solid waste collection services. Information regarding educational facilities, government institutions, medical services, fire and police, and recreation facilities is provided in a separate "Public Services" technical memorandum.

The affected environment relative to utilities described in Section 3.10.2 of the 2006 FEIS remains applicable to the proposed Phase 1 improvements. The following sections describe changed conditions, or new information relative to utilities that were not included or identified in the 2006 FEIS:

Telecommunications

The telecommunications provider Comcast was not specifically included in the 2006 FEIS; however, Comcast was included in the utility coordination and analysis process conducted for the environmental documentation based on utility coordination documentation from the FEIS design phase. Comcast provides wire line and fiber telecommunications service throughout the proposed SR 167 Project area. These facilities include overhead and buried communication lines.

Stormwater

The City of Fife constructed a new stormwater pond as part of the City's "70th Avenue East Roadway Improvement" project in 2012, which was not included in the 2006 FEIS. The stormwater pond is located on the west side of 70th Avenue East, north of 20th Street East. The City of Fife obtained an interagency agreement to construct this facility within WSDOT right of way. Attachment C depicts the location of the stormwater pond. The pond will be impacted by this project. Mitigation will be determined during the Phase 1 stormwater facility design process.

Sewer

A new sanitary sewer force main was constructed by the City of Fife in 2010 along 20th Street East from Freeman Road to 70th Avenue East. The force main was installed to serve new buildings constructed along Freeman Road. Impacts to this utility is not anticipated since the profile and alignment of 20th Street East will not be changed with the Phase 1 Improvements.

A new sanitary sewer force main was constructed by the City of Fife in 2012 along Valley Avenue East from 70th Avenue East to Freeman Road. The force main was installed as part of a Local Improvement District (LID) to serve existing and future buildings along Valley Avenue East. Impacts to this utility are not anticipated since the profile and alignment of Valley Avenue East will not be changed with the Phase 1 Improvements.

Water

A new water main has been constructed by the City of Fife in 2010 along Valley Avenue East, however impacts to this utility is not anticipated since the profile and alignment of Valley Avenue East will not be changed with the Phase 1 Improvements.

Utility Applicable Regulations and Procedures

The design of all utility relocations required for the Phase 1 improvements will adhere to the latest applicable utility regulations and standards.

WSDOT Highway Runoff Manual (M 31-16)

The WSDOT Highway Runoff Manual has been revised 7 times since May of 2006. It is not anticipated that the revisions will require additional mitigation related to impacted utilities.

WSDOT Hydraulics Manual (M 23-03)

The WSDOT Hydraulics Manual has been revised 5 times since July of 2008. These revisions include stormwater regulation updates to comply with the Washington State Department of Ecology Stormwater Manual. However, it is not anticipated that the revisions will require additional mitigation related to impacted utilities.

WSDOT Utilities Manual (M 22-87)

The current version of the WSDOT Utilities Manual has been revised 8 times since November of 2004. These revisions encompass all chapters of the manual. These revisions involve utility agreements, accommodations, environmental permitting and control zone guidelines, thus it is not anticipated that the revisions will require additional mitigation related to impacted utilities.

WSDOT Utilities Accommodation Policy (M 22-86.04)

The WSDOT Utilities Accommodation Policy Manual current version is dated March 2016. There are no published revisions to this manual since 2006.

4. Would the Phase 1 Improvements result in any new or significant impacts?

Based on the proposed Phase 1 design footprint compared to the 2006 FEIS design, a net reduction in significant utility impacts is anticipated. See Attachment A for a schematic drawing of the 2006 FEIS Build Alternative. Attachment B depicts the Phase 1 Vicinity Map. However, the reduction of the SR 167 Phase 1 project footprint compared to the 2006 FEIS Build Alternative, along with the realignment and removal of some roadway elements will reduce the overall impacts to utilities.

The proposed Phase 1 Improvements reduce the alignment length at SR 509 between Port of Tacoma Road and Alexander Way, and at I-5 between 54th Avenue East and 62nd Avenue East.

There is also a location where the project elements included in the 2006 FEIS have been already been constructed, along with the corresponding utility relocations and mitigation. The SR 167 Puyallup River Bridge Replacement Project (new bridge crossing of SR 161 over the Puyallup River) was completed in 2015.

The new and reduced impacts to utilities are described below.

New Utilities and Anticipated Impacts Summary

Water

The City of Fife's "Benthien Loop Water Main Extension Project will expand the City's water system between 54th Avenue East and 57th Avenue East. A portion of the project will provide a water main connection along 56th Avenue East that will extend across the Phase 1 right of way in a north-south direction. Construction of the project is scheduled to begin in 2018. The project will require a WSDOT Utility Permit, and mitigation is anticipated to include casing of the new water line within WSDOT right of way along with supporting geotechnical data that takes into account the future loading from the highway embankment. WSDOT will continue to coordinate with the City of Fife as the design of the water main project progresses.

Natural Gas and other Fuels

Puget Sound Energy (PSE) Liquid Natural Gas Facility and Pipeline - PSE is building a new liquefied natural gas (LNG) facility along the Hylebos Waterway at the Port of Tacoma. The facility is currently targeted for completion in 2019, and will include improvements to the existing PSE natural gas distribution system. Attachment D shows the planned distribution system improvements within the Port of Tacoma, City of Tacoma, City of Fife, and unincorporated Pierce County per the Puget Sound Energy Proposed Tacoma LNG Facility Environmental Impact Statement. PSE's "Pipeline Segment A" will cross the SR 167 Phase 1 alignment at 54th Street East and also be installed near the Phase 1 alignment at the intersection of 12th Street East and 62nd Avenue East. The PSE pipeline will continue south within 62nd Avenue East to the south side of I-5 before ending at the intersection of 62nd Avenue East and 20th Street East. It is not anticipated that the pipeline will be impacted by the SR 167 Phase 1 Improvements, therefore no mitigation is anticipated.

Utility Impact Reductions

Electrical Utilities

A reduction in impacts and anticipated relocations to existing overhead electrical lines and towers will result from the reduced footprint of the Phase 1 Improvements.

Natural Gas and other Fuels

A reduction in impacts to the Olympic Pipeline of approximately 5,000 linear feet will result from the Phase 1 design. The reduction is due to the reduced footprint of the Phase 1 Improvements, specifically from the I-5 and 54th Avenue East overpass to Port of Tacoma Road. WSDOT's SR 167 Project design team will coordinate with Olympic Pipeline to determine the extent of the impact reduction.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Similar to the 2006 Build Alternative, as described in Section 3.10.4 of the FEIS, no utility impacts associated with operation of the proposed SR 167 Phase 1 Improvements would require mitigation. All potential impacts will be addressed during the SR 167 Project design, permitting, and construction phases. All utility relocations of services will be finished and temporary service facilities removed before completion of construction.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects discussed in the 2006 FEIS remain applicable to the proposed SR 167 Phase 1 Improvements, except as noted below.

Electrical Utilities

A reduction in impacts and anticipated relocations to existing overhead electrical lines and towers will result from the reduced footprint of the Phase 1 Improvements. Specifically, the 110-kV line that crosses the proposed alignment between Alexander Avenue and 54th Avenue East will not be impacted by the Phase 1 improvements.

Natural Gas and Other Fuels

A reduction in impacts and anticipated relocations noted in the FEIS to existing gas lines will result from the reduced footprint of the Phase 1 Improvements. Specifically, approximately 5,000 linear feet of the Olympic Pipeline that runs parallel to the northbound lanes of I-5 will not be impacted by the Phase 1 improvements.

Telecommunications

A reduction in impacts and anticipated relocations noted in the FEIS to existing telecommunication lines will result from the reduced footprint of the Phase 1 Improvements. Specifically, in the 20th Street East vicinity, since the proposed roundabouts noted in the FEIS are no longer included in the Phase 1 design, thus the buried cables will not be impacted by the Phase 1 improvements.

As discussed in Section 3.10.3 of the 2006 FEIS, utility impacts will be closely evaluated during the SR 167 Phase 1 design phase and a determination made on whether or not to relocate the utility facilities. The number of relocations will depend on the final design of the mainline and each interchange.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The mitigation measures as described in Section 3.10.6 of the 2006 FEIS remains applicable to the SR 167 Phase 1 Improvements. The commitments noted in the SR 167 Extension Project's "Record of Decision" (ROD), *Attachment A Tier II FEIS Commitments List* [FHWA, October 2007] remain applicable to the Phase 1 project. A net reduction in utility impacts compared to the 2006 Build Alternative is anticipated to reduce the mitigation requirements related to utility impacts from the proposed Phase 1 Improvements.

8. Conclusion

The SR 167 Completion Project's affected area of Phase 1 is smaller than the 2006 FEIS affected area. With adherence to current regulatory requirements, no new significant impacts would occur to utilities from construction and operation of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures would be required.

References

City of Fife, 2017. http://cityoffife.org/

Ecology and Environment Inc., 2015. *Puget Sound Energy Proposed Tacoma Liquefied Natural Gas Facility Final Environmental Impact Statement.* Tacoma, Washington.

Washington State Department of Transportation, 2016. *Highway Runoff Manual.* Olympia, Washington.

Washington State Department of Transportation, 2017. *Hydraulics Manual.* Olympia, Washington.

Washington State Department of Transportation, 2016. *Utilities Manual.* Olympia, Washington.

Washington State Department of Transportation, 2016. *Utilities Accommodation Policy.* Olympia, Washington.

227 Attachments

Attachment A



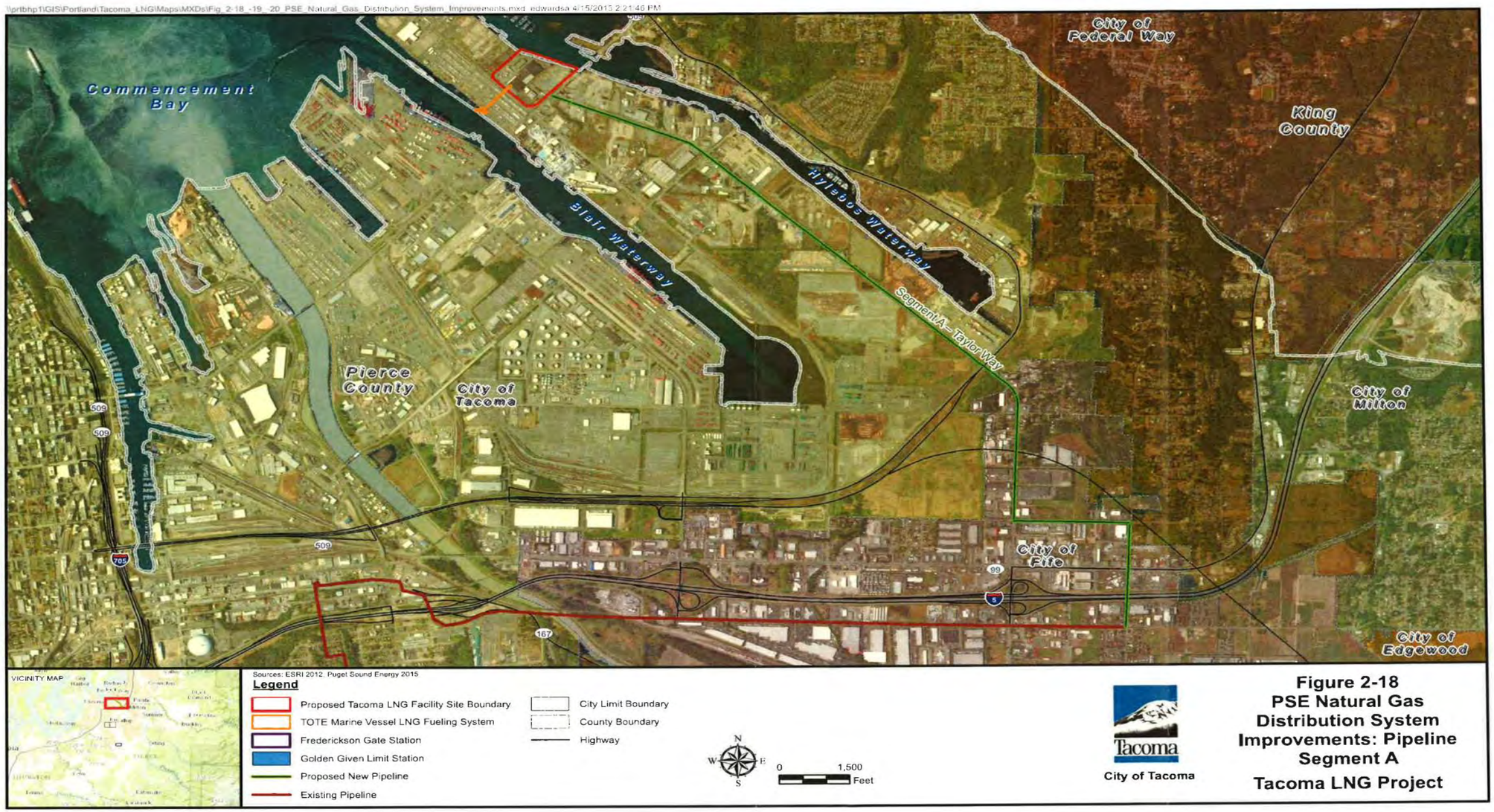
Attachment B



Attachment C



Attachment D



Land Use and Socioeconomics

COPY TO:	**Project File**
PREPARED BY:	**Karin Fusetti and Hussein Rehmat HNTB Corporation**
DATE:	**September 24, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Introduction

Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to land use and socioeconomics.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted	4 lanes (78-ft), 50 MPH posted

	speed	speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right-hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

As shown in Figure 1, the SR 167 Project Phase 1 Improvements would occur within the same jurisdictions that were discussed in the 2006 FEIS, including:

- City of Tacoma/Port of Tacoma
- City of Fife
- City of Puyallup

- City of Milton
- City of Edgewood
- Unincorporated Pierce County
- Puyallup Tribe of Indians

Major changes in land use were identified by comparing a 2006 aerial photo of the project area with a current aerial photo of the project area. Areas where new industrial development has occurred since the 2006 FEIS were delineated and discussed according to each jurisdiction below.

Methods of Analysis

The land use study area for the Re-evaluation consisted of the jurisdictions through which the project alignment would travel. The affected environment was based on existing land use patterns, zoning, and adopted comprehensive plans and other plans and policies relevant to each jurisdiction's land use. Land use patterns were described based on a property inventory, review of recent aerial photographs, and field reconnaissance. Recent and future land use trends were also described based on a review of the previous 2006 FEIS and comparing older aerial photos with more current photos of the project area. Information gathered from Ecology's SEPA register was also reviewed to determine pending public and private development activities near the project corridor. This information was important in determining the nature of land use changes that each area is currently experiencing.

The impact analysis assessed direct and indirect land use impacts associated with project construction and operation related to existing and future allowable land use patterns. The analysis was compared back to the original analysis contained in the 2006 FEIS and 2004 Land Use/Farmland/Social-Economic/Environmental Justice Discipline Report. The Farmland and the Environmental Justice analyses are contained in separate Discipline Reports.

The general descriptions of the economies of the local jurisdictions was collected from a variety of federal, state, and local sources, including the U.S. Bureau of the Census, Washington State Department of Revenue, Puget Sound Regional Council (PSRC), Pierce County Assessor and from the local jurisdictions' websites. Existing and forecasted population, and employment data was obtained from PSRC. Recent and future economic trends were described based on the current information and a review of information provided in the previous 2006 FEIS. The economics discussion also identified the existing and projected economic setting within each jurisdiction and documented PSRC's current estimates and future projections of population, and employment. Major employment centers served by the project were also identified.

City of Tacoma/Port of Tacoma

Land Use

Consistent with the 2006 FEIS, the northern terminus of the Phase 1 Improvements fall within the Tacoma City limits where they will connect with SR 509 near the Port of Tacoma (Figure 1).

Figure 2 includes two panels, a recent aerial photo of the Port of Tacoma and a photo from 2006. Since the 2006 FEIS there have been some notable changes to the land located at the end of the Blair Waterway. This land was described as vacant land, log

storage, auto import storage, and warehouse/packaging in the 2006 FEIS and has since become a new major container terminal called the Pierce County Terminal. The Port also opened the 146.5-acre Marshall Avenue Auto Facility and opened other major new facilities including redeveloping and expanding the Husky Terminal and completing the Olympic Container Terminal. Development of these facilities were not mentioned in the 2006 FEIS.

Zoning for the Port of Tacoma land has not changed since the 2006 FEIS, except for the M-3 and M-2 (Heavy Industrial) designations which have revised to Port Maritime and Industrial (PMI). The PMI District is intended to allow all industrial activities that are not permitted in other districts. There is also a Manufacturing/Industrial Center (MIC) overlay that was established in the Puget Sound Regional Council's (PSRC) VISION 2040 Plan and the City of Tacoma's Comprehensive Plan. The MIC overlay is a designation that protects the manufacturing and industrial uses and targets the area for significant regional employment growth. One of the larger development projects near the project area is located at 4801 E 8th Street; the Prologis Port of Tacoma Building D Project, has recently been constructed and includes approximately 320,000 square foot warehouse building and related site improvements (see Figure 2).

VICINITY MAP

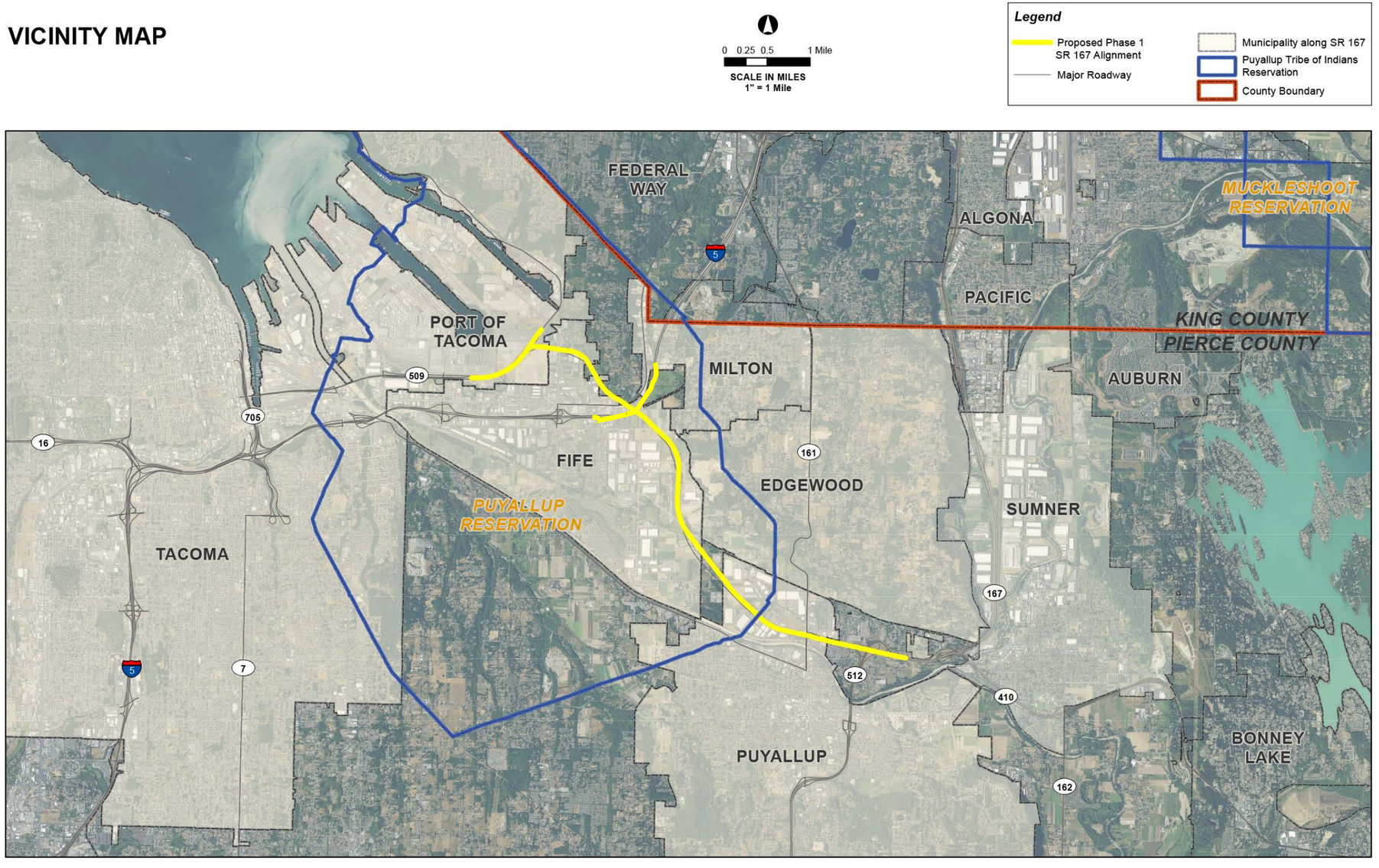


Figure 1. Project Vicinity



Port of Tacoma 2017
Figure 2

Areas where Industrial/Commercial Development occurred since 2006



Port of Tacoma 2006
Figure 2 Continued

Population Characteristics and Housing

The population in the City of Tacoma has increased between 2000 and 2010; growth that is consistent with what was described in the 2006 FEIS. Table 2 below shows the population characteristics for the City of Tacoma from both the 2000 U.S. Census and the more recent 2010 U.S. Census. Over the past decade, the percentage of minority population has grown along with overall population growth. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 296,918 in the year 2035, a growth of 34 percent over 2010 estimates (PSRC 2015).

Table 2. Population Characteristics—City of Tacoma

	Year	Total Population	Minority	Hispanic	Elderly (65+ years)	Low-Income
City of Tacoma	2000	193,556	31%	7%	20%	16%
	2010	198,397	35%	11%	11%	17%

Source: U.S. Census Bureau, 2000 U.S. Census, 2010 U.S. Census, 2006-2010 American Community Survey

Economic Activity

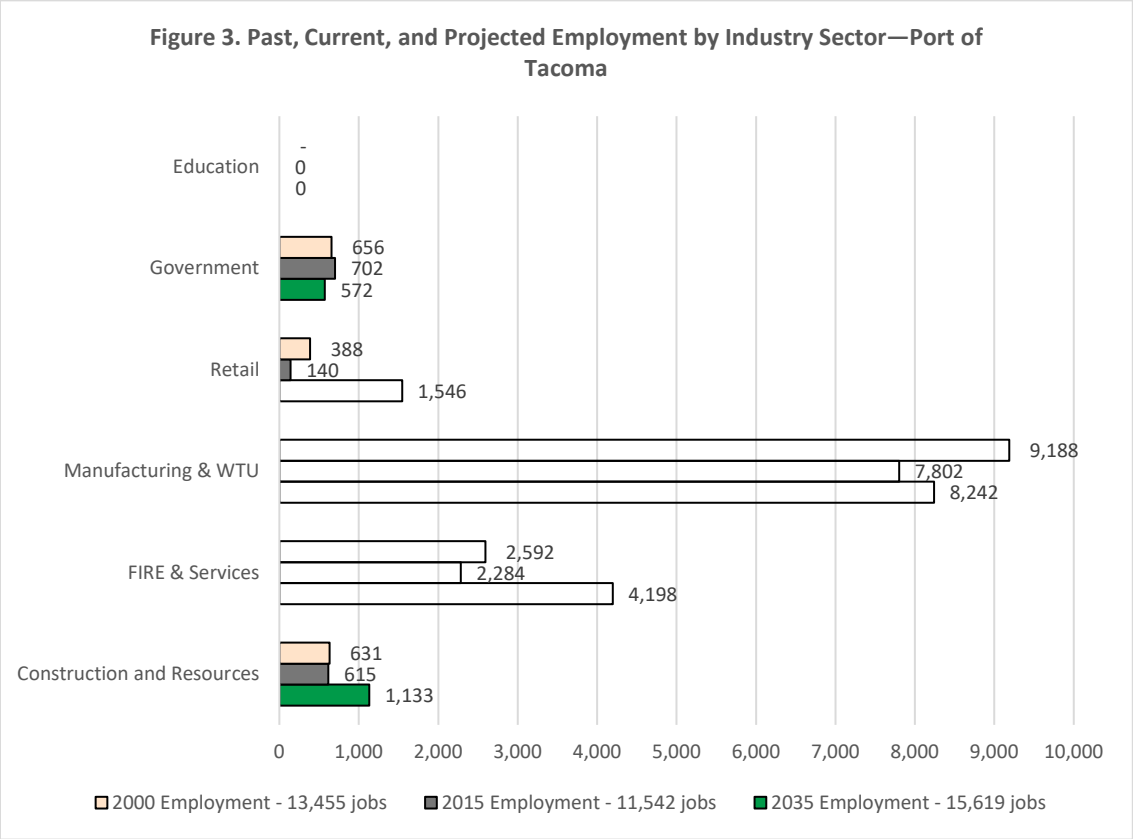
The 2006 FEIS, predicted a substantial increase in truck traffic to and from the Port of Tacoma between the years of 2004 and 2014. It also indicated that the Port of Tacoma strongly endorses a new SR 167 corridor that would connect with SR 509, as a critical transportation infrastructure need. In 2004 at the time of the FEIS, the Port of Tacoma was ranked among the top 10 ports in the nation and was second in terms of container volume. During this time, it was also one of the fastest growing ports in the United States with a 34 percent increase in operating income in 2000. Today, the Port of Tacoma is the 23rd largest among all United States ports and is still a major landowner within the City of Tacoma. The Port continues to operate and lease significant piers, docks, wharves, cargo handling equipment, and related upland facilities and continues to be home to Tacoma and Pierce County's highest concentration of industrial and manufacturing activity, a major part which is focused on port and marine terminals, marine cargo, on-dock intermodal rail yards, container terminals, roll-on/roll-off facilities, non-containerized cargo facilities (moving grain, fruit, alumina, and wood chips), automobile import facilities, shipyards, boat building and dry docks. Some of the largest cargo terminals, especially the container terminals, are owned and leased by the Port of Tacoma, but there are also numerous private facilities that transfer cargo to and from ships and barges.

In 2012 the Port's export tonnage ranked 13th in the U.S. According to Port of Tacoma statistics, containerized trade accounts for nearly half of the total tonnage moving through the Port. Manufacturers and farmers from throughout Washington import and export a wide variety of products through the Port of Tacoma, generating jobs in Tacoma and throughout the state.

As was the case in 2006, the Port serves as a major economic engine for Pierce County, creating thousands of family-wage jobs and serving as a catalyst for continued economic development. In 2013, Port of Tacoma maritime cargo and industrial lease activity generated 29,110 direct, induced and indirect jobs as compared to the 22,000 jobs referenced in the 2006 FEIS. Since 2006, salaries for direct employees of the Port have increased to an average salary of $57,492 per year, about 65 percent more than the county median earnings for workers. Statewide, over 266,800 jobs were related to cargo moving via the Port of Tacoma marine terminals. Maritime activity at the Port of Tacoma marine terminals generated about $76.1 million in local taxes in Pierce County (Port of Tacoma 2014).

Figure 3 presents the current and projected employment for the Port of Tacoma by industry sector. The 2006 FEIS indicated that the overall economy of Pierce County experienced a 3.7 percent growth rate over a year and a half (2000 - 2001); while growth was not expected to accelerate in 2001. It also

indicated that the rate of growth is expected to accelerate in 2001 to a 2.5 percent increase, creating just over 6,000 new jobs countywide. Since the 2006 FEIS, employment at the Port of Tacoma has decreased but the makeup of jobs remains consistent. The highest percentage of jobs at the Port, as expected, are and continues to be in the manufacturing, wholesale trade, transportation, and utilities sectors. In addition, as of 2015, the number of jobs at the Port of Tacoma are expected to increase on into 2035. Employment for the Port of Tacoma is projected to increase in all the sectors except for the government sector; with the largest growth anticipated in the retail sector.



Source: Puget Sound Regional Council, Seattle, WA - 2015 Covered Employment Estimates by Jurisdiction; Land Use Vision Version 1 (LUV.1) Dataset
WTU=Warehouse, Transportation, and Utilities; FIRE=Finance, Insurance, and Real Estate

Beyond the Port of Tacoma, the City of Tacoma supports a variety of economic activities and has strong and increasing employment numbers. Employment in the City of Tacoma is expected to increase from 104,759 jobs in 2015 to 162,323 jobs in 2035. The largest employment sector in Tacoma for 2015 was the finance, insurance, real estate, and services sector (55.1%). Job growth in this sector is expected to continue for the year 2035 (55.6%). Retail and construction and resources jobs are also expected to increase in the City of Tacoma in 2035, 18.3 percent and 3.3 percent respectively.

According to the 2011-2015 American Community Survey 5-year Estimates the City of Tacoma has a 56.9 percent employment rate. Major employers in the city include local public-school districts, MultiCare Health System, Washington State Employees, Franciscan Health System, Pierce County Government, Washington State Higher Education, City of Tacoma, Emerald Queen Casino, Walmart, Costco, and Tacoma Public Utilities.

Income

Income levels in the City of Tacoma have also continued to increase since the 2006 FEIS, from a median household income that was $37,879 in 2000 to a current median household income of $52,042 (see Table 3).

Table 3. Income Characteristics—City of Tacoma				
	2000		2015	
	Median Household Income	Per Capita Income	Median Household Income	Per Capita Income
City of Tacoma	$37,879	$19,130	$52,042	$27,049
Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates				

Tax Revenue

Tax revenue generated from property and economic activity in the City of Tacoma plays a major role in revenues for the city's general fund. Table 4 shows the revenue sources for the city's general fund. Sales and business taxes make up 42 percent of the general funds total revenues.

Table 4. General Fund Revenue Sources—City of Tacoma		
Source	Amount (millions of dollars)	Percent
Property Tax	$115.96	25%
Local Sales Tax[1]	$98.89	21%
Business Tax[2]	$94.63	21%
Utility Tax[3]	$86.30	19%
Other revenues including Licenses & Permits, Charges for Services, Fines & Forfeits, and Intergovernmental Revenues	$65.43	14%

Source: 2017-2018 City of Tacoma Adopted Biennial Budget-General Fund Revenues. The General Fund provides and accounts for most traditionally recognized local government functions.

[1] Tacoma consumers pay a sales tax rate of 10.1%

[2] Business taxes are paid based on the total income of a business. The City offers exemptions from business taxes for businesses whose gross receipts are less than $250,000 annually.

[3] Utility taxes are paid by both private and public utilities and are calculated based on the total operating revenues earned by the utilities.

As was indicated in the 2006 FEIS, industrial and commercial property values along the development corridor are expected to increase as new developments and relocations compete for the small amount of available frontage space along the existing highway corridors (I-5 and SR 99). Commercial properties within the project corridor are valued from $1.36 to $46 per square foot for vacant commercial land in during the time period of 2015-2018. Improved commercial properties within the project corridor characteristically bring between $85,000 to more than $6,800,000 per site. Properties closest to the I-5 corridor typically demand the highest value.

Transportation

Transportation challenges have not improved for the Port since the 2006 FEIS. The 2006 FEIS, predicted a substantial increase in truck traffic to and from the Port of Tacoma between the years of 2004 and 2014. It also indicated that the Port of Tacoma strongly endorses a new SR 167 corridor that would connect with SR 509, as a critical transportation infrastructure need. Today, truck traffic is traveling between the Port and warehousing and distribution centers located in the Kent Valley, Fife/Puyallup/Sumner, Tacoma, Frederickson, Dupont, Lacey/Olympia, and Centralia/Chehalis. The existing SR 167 is the primary freeway connecting the Kent and Puyallup River valleys to the Seattle/ Tacoma/Bellevue metropolitan area. For the Port, the extension of SR 167 would provide a much-improved connection to key warehousing and trans-loading centers in Fife, Sumner, and Kent. As was the case in 2006, the Port of Tacoma continues to endorse the SR 167 project and identifies the project as the highest priority regional project in the Tideflats Area Transportation Study (TATS) Final Report (2011).

City of Fife

Land Use

Consistent with the 2006 FEIS, the majority of the Phase 1 Improvements will occur within the Fife city limits (Figure 1). In 2006, the existing land uses adjacent to the 2006 Build Alternative alignment were primarily industrial/commercial, agricultural, and vacant/undeveloped. Since the 2006 FEIS, the amount of agricultural and vacant land adjacent to the Project's Phase 1 alignment has diminished and industrial/commercial has increased. Figures 4, 5 and 6 each include two panels, one panel showing a current aerial photo that identifies areas where major industrial development has occurred since the 2006 FEIS and a second panel showing a historical 2006 photo. These new developments have occurred in areas that were once predominantly agricultural and vacant/undeveloped land. This land has become more industrialized with manufacturing and warehouse/distribution facilities replacing farmland. Development has also been especially prevalent between 70th Avenue East and the proposed SR 167 alignment and between Freeman Road E and the proposed SR 167 alignment.

As was the case in 2006, the City's primary business district runs east and west along Pacific Highway East (SR 99). This area contains a large number of commercial establishments, industrial uses, small residences, and vacant land. The area north of SR 99 along 54th Avenue East continues to be intensively developed with retail/business, commercial, and industrial/manufacturing uses. Since 2006, there has been new industrial and commercial development including Sound Analytical Services, Odom Corporation, Fife Landing North, and Rushforth Construction Company's office building. The zoning in this area has not changed since 2006 and continues to be industrial (I) and commercial (RC and CC). The area along 20th Street East contains heavy commercial uses, including car and recreational vehicle dealerships.

The southeastern part of Fife contains industrial developments that have occurred since 2006 as well as agriculture lands and a number of single family homes that existed in 2006. The city's current comprehensive plan notes that these residences are at risk of being displaced by commercial or industrial development because they are easily accessible to the area's transportation network.

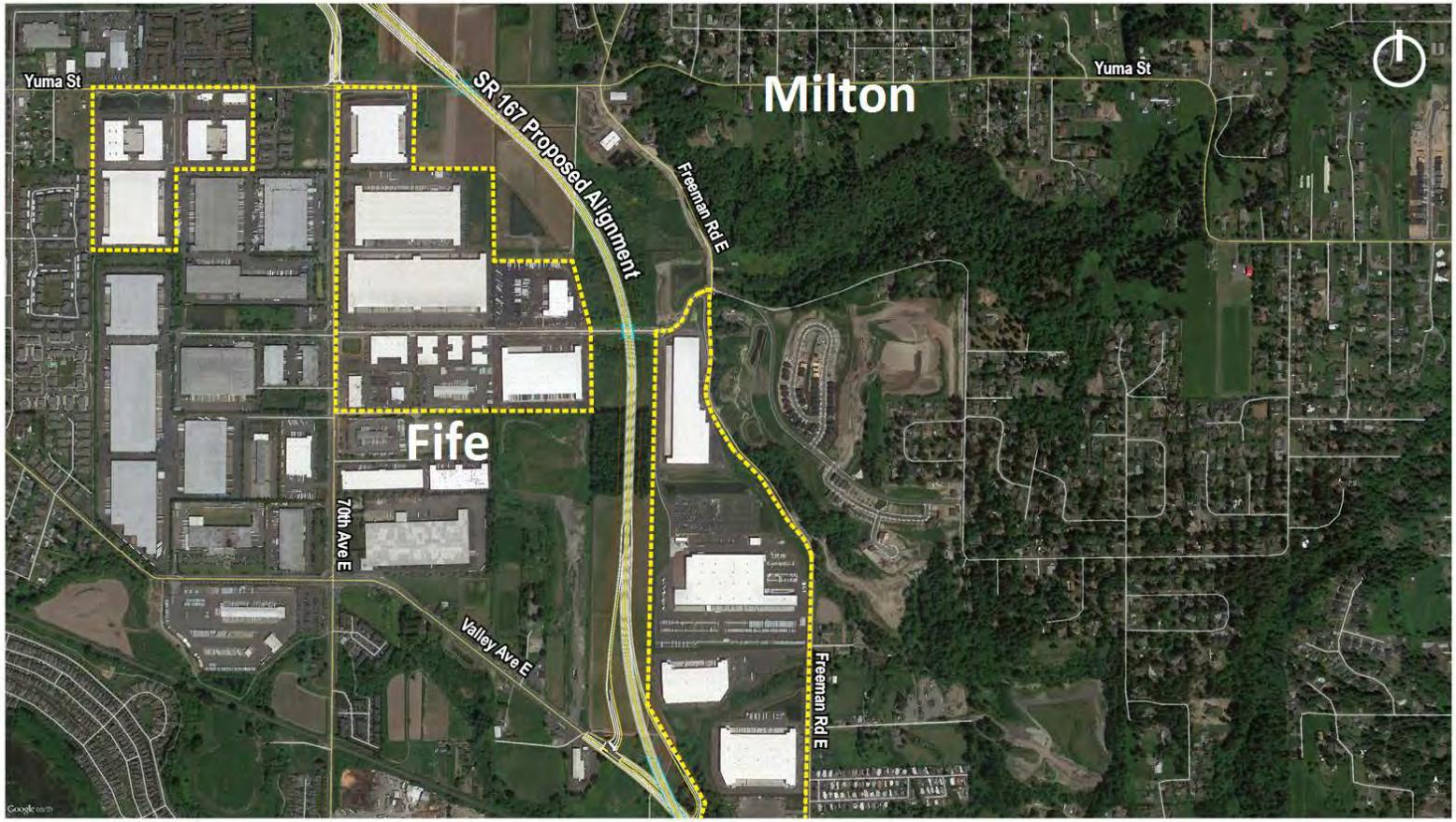


Fife and Milton (I-5 to SR 509) 2017
Figure 4

Areas where Industrial/Commercial Development occurred since 2006



Fife and Milton (I-5 to SR 509) 2006
Figure 4 Continued

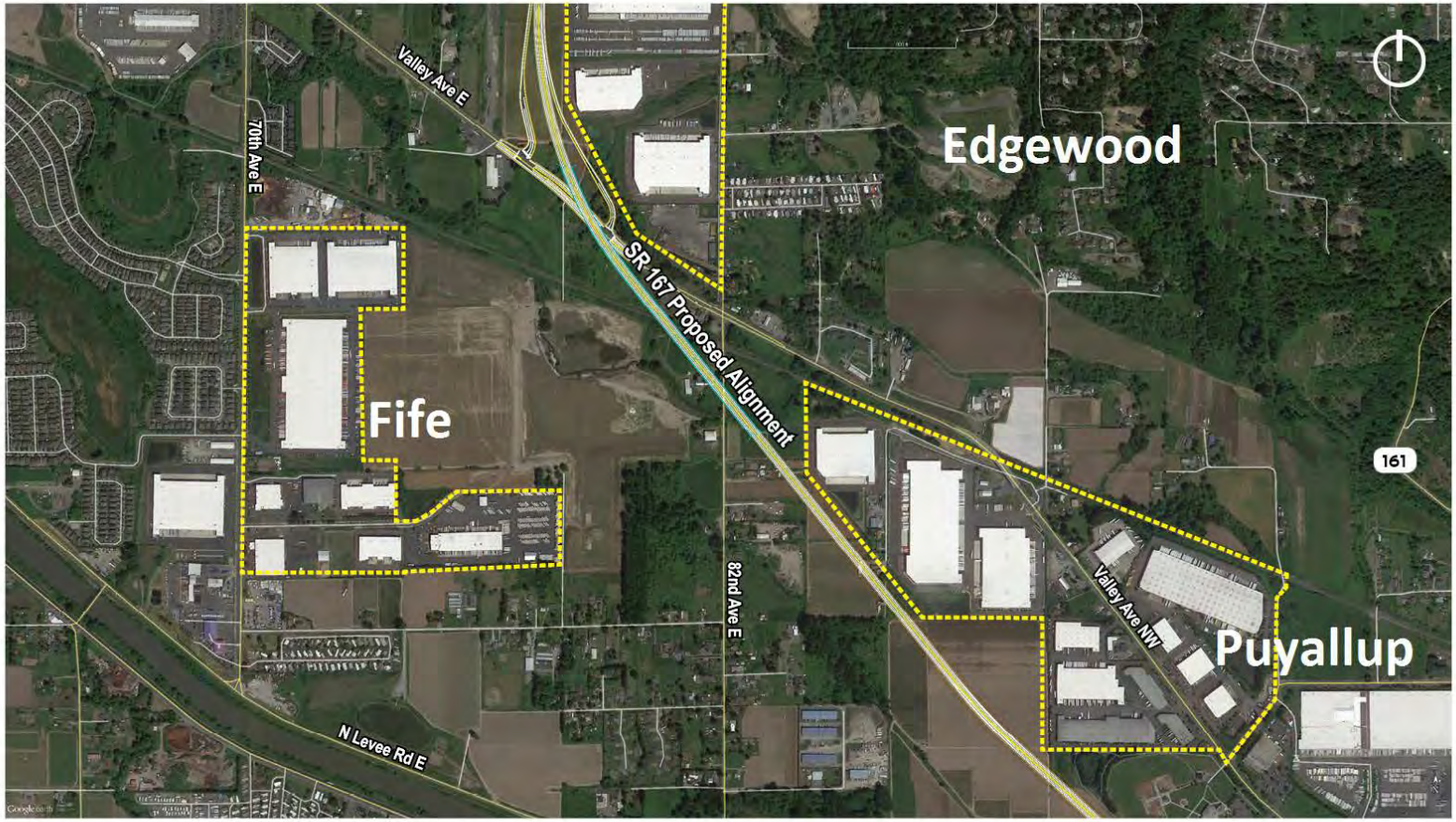


Fife and Milton (Fife I-5 to Valley Interchange) 2017
Figure 5

Areas where Industrial/Commercial Development occurred since 2006

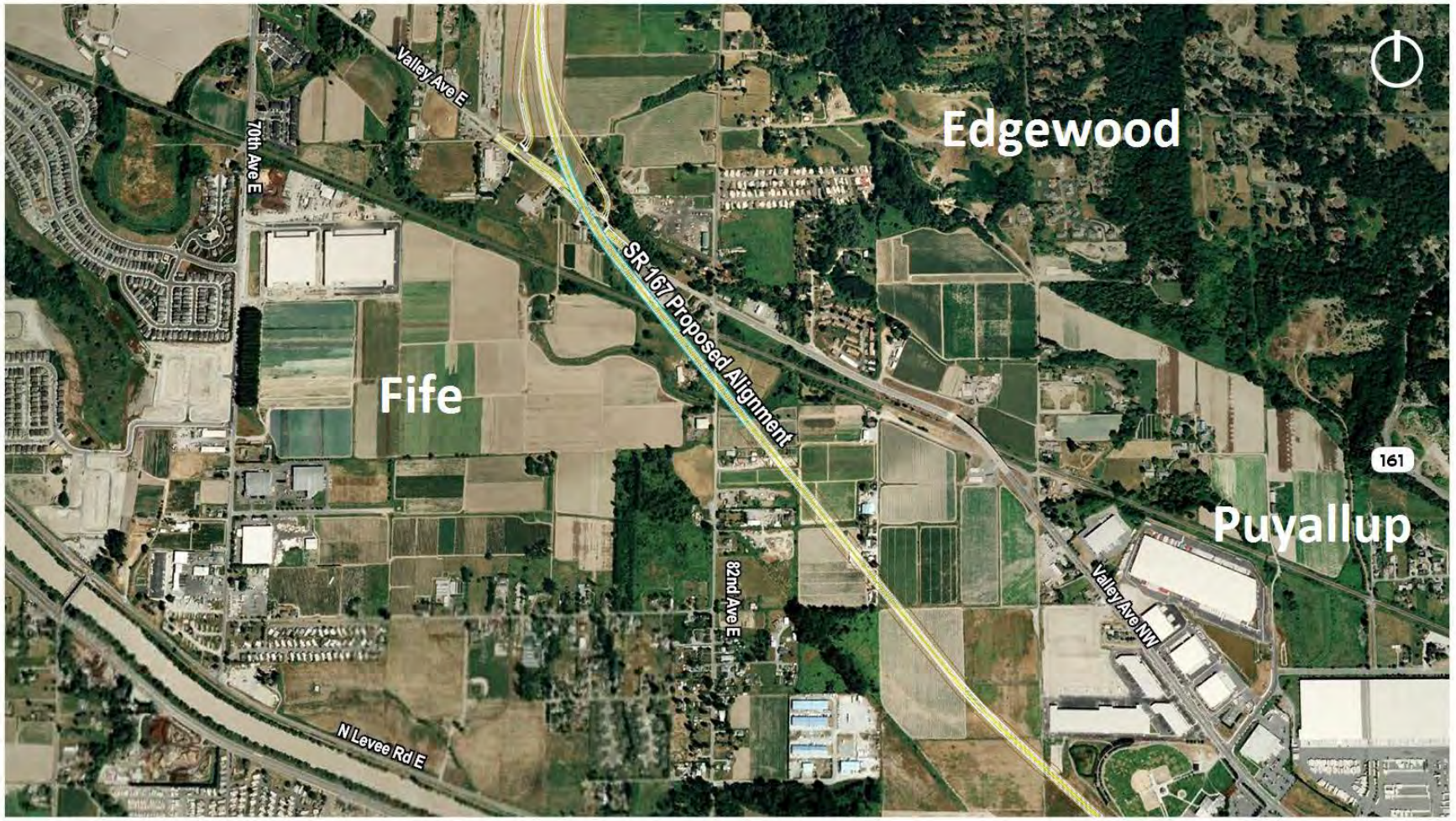


Fife and Milton (Fife I-5 to Valley Interchange) 2006
Figure 5 Continued



Puyallup and Milton (Valley Interchange) 2017
Figure 6

Areas where Industrial/Commercial Development occurred since 2006



Puyallup and Milton (Valley Interchange) 2006
Figure 6 Continued

Consistent with the 2006 FEIS, Fife has zoned the area adjacent to the SR 167 corridor for industrial and commercial use. The City has not designated any lands within its Urban Growth Area as agricultural. The City of Fife has several development projects which are in review, permitted and/or have been constructed near the project area including:

- Freeman Road project (under construction)
- US Foods project, 2204 70th Avenue East (under construction
- Lakeridge Industrial Development, 6815 26th Street E
- New Sound Transportation project, 7495 26th Street E
- Van Halder project, 520 54th Avenue E.
- 8th Street Warehouse project, 5306 7th Street E
- Trammell Crow, 2502 Freeman Road.

Population Characteristics and Housing

The population in the City of Fife has almost doubled between 2000 and 2010; growth that is consistent with what was described in the 2006 FEIS. Table 5 below shows the population characteristics for the City of Fife from both the 2000 U.S. Census and the more recent 2010 U.S. Census. Over the past decade, the percentage of minority population has grown along with overall population growth. The City of Fife experienced a 13.8 percent increase in minority population. The Hispanic population in Fife also saw a slight increase while the elderly and low-income populations experienced a decrease. In both 2000 and 2010 the City of Fife had a higher percentage of minority and Hispanic, elderly persons compared to the county. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 11,684 in the year 2035, a growth of 27 percent (PSRC 2015).

Table 5. Population Characteristics—City of Fife

	Year	Total Population	Minority	Hispanic	Elderly (65+ years)	Low-Income
City of Fife	2000 Census	4,760	31.0%	14.0%	7.4%	14.9%
	2010 Census	9,173	44.8%	17.4%	6.5%	10.6%
Source: U.S. Census Bureau, 2000 U.S. Census, 2010 U.S. Census, 2006-2010 American Community Survey						

Based on data provided by the 2010 U.S. Census, occupancy and vacancy rates in the City of Fife closely mirror those of the county as a whole; 93.5 percent of all units are occupied leaving a 6.5 percent vacancy rate. Homeowner vacancy rates in the city are 2.3 percent with rental vacancy rates being 6.4 percent. The average household size for the City of Fife is 2.5.

Economic Activity

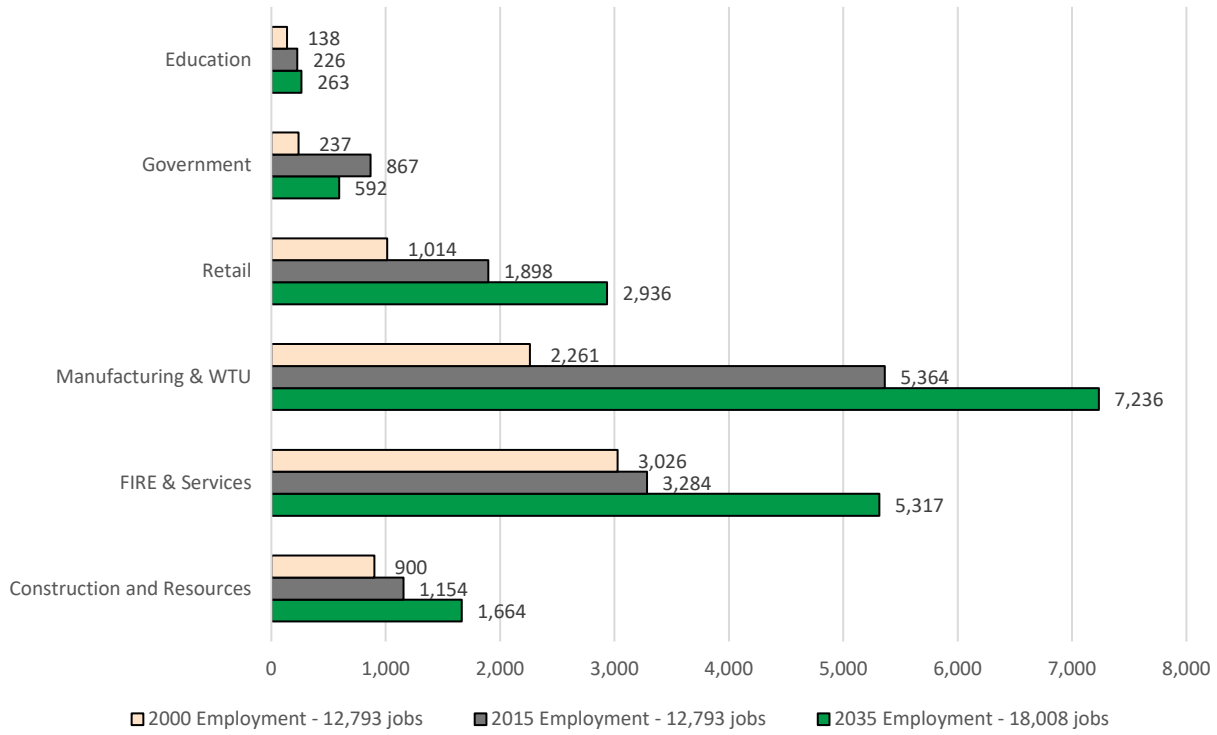
The City's location and visibility from Interstate-5 and Highway 99 has not changed since the 2006 FEIS and continues to attract industrial uses. The composition of manufacturing employment in Fife is similar to but greater than 2006 and reflects the City's unique location in proximity to the Port of Tacoma and the type of business the City has attracted as a result.

As shown in Figure 7, the largest current and projected employers in Fife are in the manufacturing and wholesale trade, transportation, and utilities sector. The composition of employment in Fife is different than Pierce County, where the largest employment sector is finance, insurance, real estate, and services.

Fife's total employment is projected to increase from 12,793 in the year 2015 to 18,008 by the year 2035, or by 41%. However, the most growth for the City of Fife is expected in the industry sector.

According to the 2011-2015 American Community Survey 5-year Estimates the City of Fife has a 64.6 percent employment rate, which is higher than Pierce County (56.6%). Major employers in the city include Milgard, Mission Foods, American Fast Freight, Continuant, Costco Wholesale Corp, Gensco Inc., Emerald Queen Hotel & Casino, FedEx Freight, Motel 6, Odom Corporation, Pexco LLC, Comcast, Smith Fire Systems, United Postal Service, US Foodservice, Valdo's Catering, and Prologis Distribution Services.

Figure 7. Past, Current, and Projected Employment by Industry Sector—City of Fife



Source: Puget Sound Regional Council, Seattle, WA - 2015 Covered Employment Estimates by Jurisdiction; Land Use Vision Version 1 (LUV.1) Dataset

WTU=Warehouse, Transportation, and Utilities; FIRE=Finance, Insurance, and Real Estate

Income

Income levels in the City of Fife have continued to increase since the 2006 FEIS, from a median household income that was $31,806 in 2000 to a current median household income of $55,603 (see Table 6).

Table 6. Income Characteristics—City of Fife

	2000		2015	
	Median Household Income	Per Capita Income	Median Household Income	Per Capita Income
City of Fife	$31,806	$16,723	$55,603	$25,467

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Tax Revenue

Approximately 63.8 percent of the City of Fife's general fund is made up of tax revenue. Of that 63.8 percent, 32.2 percent is generated from sales tax. The revenue sources for the City's general fund are presented in Table 7 below.

Table 7. General Fund Revenue Sources—City of Fife

Source	Amount (in millions of dollars)	Percent
Property Tax[1]	$3.03	16.0%
Sales Tax[2]	$6.29	32.2%
Utility Tax[3]	$1.49	15.4%
Other Tax[4]	$0.26	0.2%
Licenses and Permits	$0.008	2.7%
Intergovernmental	$5.44	3.3%
Charges for Services	$6.98	25.6%
Fines and Penalties	$27.96	2.5%
Miscellaneous	$18.51	1.8%

Source: City of Fife 2015-2016 Adopted Biennial Budget-2018 forecast. The General Fund provides and accounts for most traditionally recognized local government functions.
Notes:
[1] The City of Fife portion makes up approximately 12% of the total bill received by property owners.
[2] The City's effective sales tax rate is 9.9% with .84% going directly to the city.
[3] A utility tax is currently imposed by the City of Fife on the following utilities: Electric, Water, Natural Gas, Sewer, Solid Waste, Strom Drainage, Cable TV and Telephone.
[4] This includes the real estate excise tax, a 1.28% tax levied on all sales of real estate, measured by the full selling price, including the amount of any liens, mortgages, and other debts given to secure the purchase.

Transportation

In 2006 as well as today, the movement of people and goods within and through Fife play a role in determining land use patterns. The City's proximity to the Port of Tacoma, the City of Tacoma, south King County and major employment areas, plus its accessibility to the interstate highway system has not changed since 2006 and continues to support the planned industrial growth in the area. These factors make the Fife area road network one of the most heavily traveled in Pierce County. The 2006 FEIS indicated that the extension of SR 167 to SR 509 has been promoted by both the City of Fife. The current City's Comprehensive Plan also supports the project and explicitly expresses the need for public investment in roads, including the extension of Highway 167 and the rebuilding of the Port of Tacoma Interchange and the 54th Avenue Interchange at Interstate 5.

City of Puyallup

Land Use

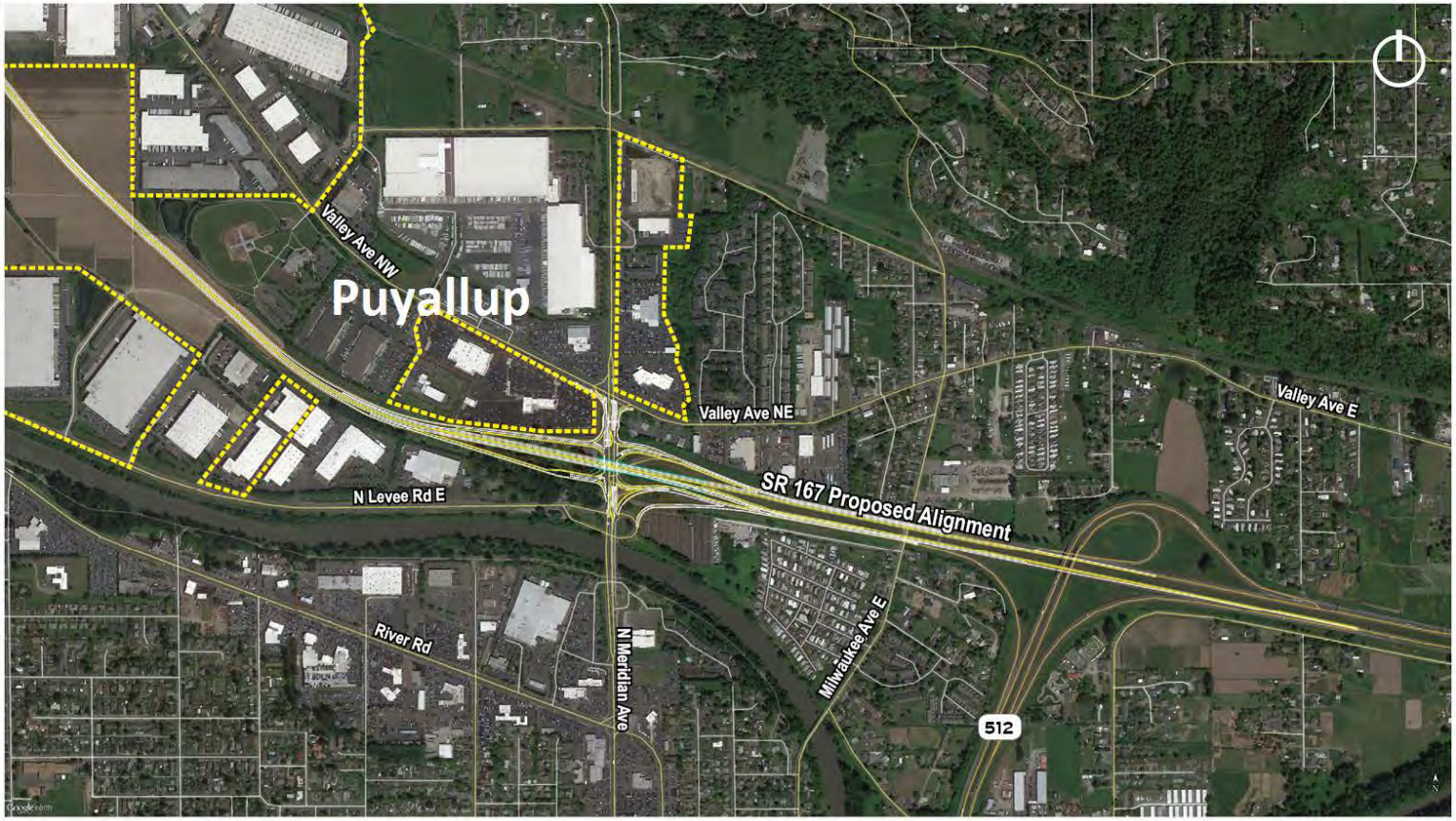
Consistent with the 2006 FEIS, the Phase 1 Improvements are located within the northern section of the city of Puyallup east of Freeman Road to just west of the current terminus of SR 167 at SR 161. A city recreation center (ball fields) located in the North Puyallup area on Valley Avenue sits adjacent to and north of the Phase 1 Improvements. Figures 6 and 8 include two panels, the first is a current aerial that identifies where recent development has occurred within the project area within the City of Puyallup and the second is a historical photo from 2006. As shown, the agricultural land uses adjacent to the Phase 1 Improvements has changed into land uses consistent with the City's "Limited Manufacturing"

zoning. Large swaths of land have been developed into industrial and manufacturing areas that have required significant space, and have been converted from agricultural lands.

Traditionally, Puyallup housed agriculture-supporting industrial uses (e.g. cold storage, canneries), as well as various local service companies. In recent decades, this activity has diversified, with the development of several large distribution centers, manufacturing facilities and related industrial space. In 2015, Puyallup has 667.5 acres of land which are zoned for one of the City's "Industrial" or "Business Park" zone districts. This industrially-zoned land is focused in multiple areas, including the greater Valley Avenue/Levee Road vicinity of North Puyallup, the East Main/Inter-Avenue area and other pockets. While the aforementioned industrial parks in North Puyallup cater primarily to larger corporate tenants, Inter-Avenue contains smaller lots and tends to house smaller, locally-based industrial/service-oriented users. One noteworthy site is the former semiconductor plant on 39th Avenue SE, which contained almost 700,000 square feet of research park/chip manufacturing space in a 90-acre corporate campus environment. Purchased by the Benaroya Corporation in 2007, this facility was renovated, re-named the "South Hill Business & Technology Center," and already has seen success attracting corporate business tenants.

Consistent with the 2006 FEIS, Puyallup zoning is currently ML (Limited Manufacturing) in the section adjacent to the Puyallup River and consists of light industrial facilities and warehouses. The rest of the North Puyallup area is zoned CG (General Commercial), which permits multi-family housing development of 10 to 20 units per acre. The Agriculture Overlay (AGO). zone is intended to ensure that agricultural lands within these areas are treated sensitively to the location of and pressures from surrounding urban development. It is the intent of this zone to encourage the continuation of agricultural activities as defined herein until such time that these lands are needed for urban uses. It is also the intent of this zone to protect agricultural activities from zoning and nuisance complaints.

At this time, there are no notable development projects in City of Puyallup in review, permitted and/or that are currently underway near the SR 167 Project Phase 1 alignment.



Puyallup (Meridian Interchange) 2017
Figure 8

Areas where Industrial/Commercial Development occurred since 2006



Puyallup (Meridian Interchange) 2006
Figure 8 Continued

Population Characteristics and Housing

The population in the City of Puyallup has increased about 13 percent between 2000 and 2010; growth that is less rapid than what was described in the 2006 FEIS. Table 8 below shows the population characteristics for the City of Puyallup from both the 2000 U.S. Census and the more recent 2010 U.S. Census. Over the past decade, the percentage of minority population in Puyallup has decreased significantly, about 26 percent. While the Hispanic population saw a slight increase as did the elderly and low-income populations. According to the PSRC land use forecast dataset, the population in the City is expected to continue to grow and is forecasted to increase to 58,347 in the year 2035, a 58 percent increase (PSRC 2015).

Table 8. Population Characteristics – City of Puyallup

	Year	Total Population	Minority	Hispanic	Elderly (65+ years)	Low-Income
City of Puyallup	2000 Census	32,682	41.3%	5.1%	10.7%	6.7%
	2010 Census	37,022	15.6%	6.9%	12.4%	8.7%

Source: U.S. Census Bureau, 2000 U.S. Census, 2010 U.S. Census, 2006-2010 American Community Survey

Based on data provided by the 2010 U.S. Census, occupancy and vacancy rates in the City of Puyallup closely mirror those of the county as a whole; 92.1 percent of all units are occupied leaving a 7.9 percent vacancy rate. Homeowner vacancy rates in the city are 2.6 percent with rental vacancy rates being 8.5 percent. The average household size for the City of Puyallup is 2.5.

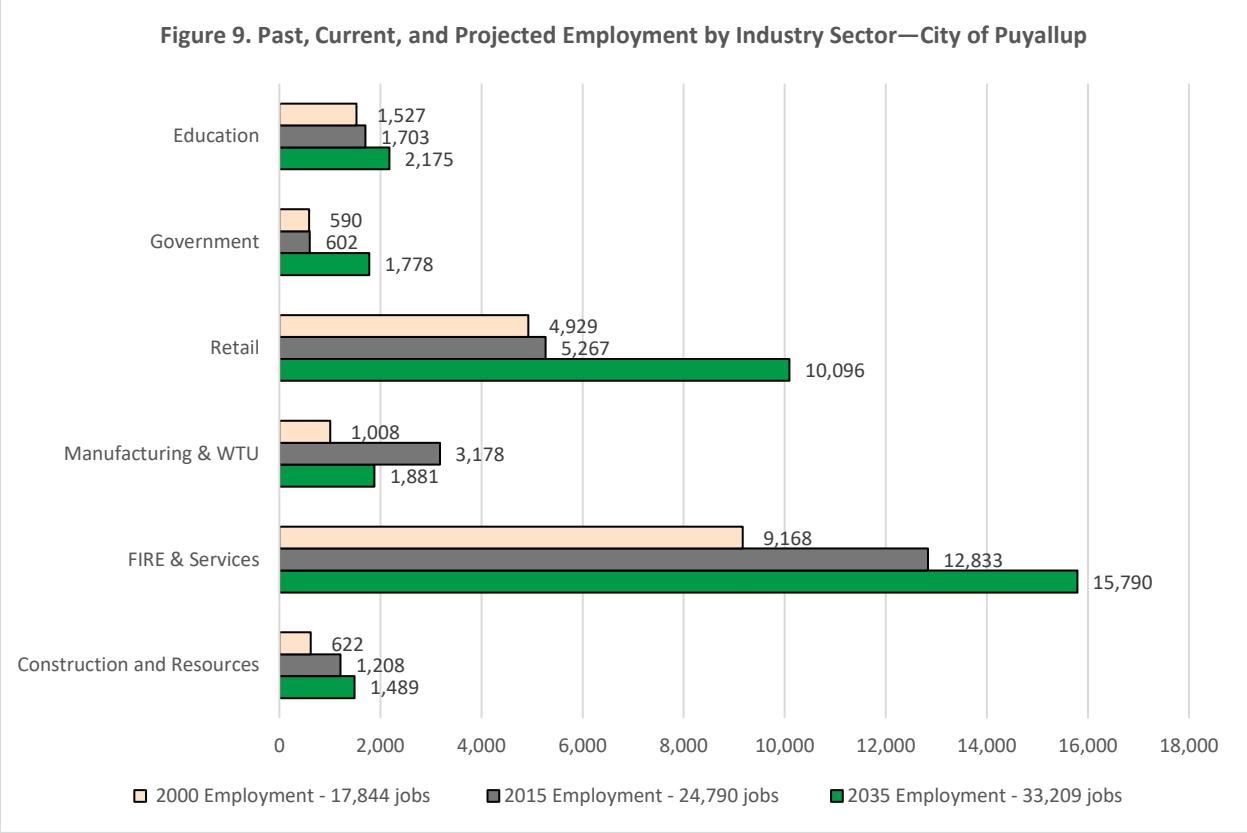
Economic Activity

Puyallup was once an agricultural community but more recently has become a regional commercial and service center for eastern Pierce County. Puyallup is a city with a convenient shopping district and a growing employment base. The City's location is central to the four-county Puget Sound region and its connection to SR 410 and SR 512 and SR 167 provide easy proximity to greater Puget Sound and its international ports. Puyallup also serves as the top boarding location for Sound Transit's "Sounder" commuter rail service to Tacoma, Seattle and Everett.

As a part of the last Comprehensive Plan update, the City of Puyallup has been planning for expected growth in employment over the next 20 years through 2035. Based on growth estimates from the PSRC, Puyallup is preparing for over 8,400 new workers by 2035. This is an expected 34 percent growth in employment.

Figure 9 presents the current and projected employment for the City by industry sector. Similar to Pierce County, the Finance, Insurance, Real Estate, and Services industry made up the single-largest portion of the jobs based in Puyallup in 2015. This trend is expected to continue in 2035, though with an increase of about 23 percent. Looking forward, employment growth in the retail and government: public employment sectors is expected in the City of Puyallup.

With heavily-used transportation corridors constricting both commuters and trade, regional mobility is a challenge for Puyallup and surrounding jurisdictions.



Source: Puget Sound Regional Council, Seattle, WA - 2015 Covered Employment Estimates by Jurisdiction; Land Use Vision Version 1 (LUV.1) Dataset
WTU=Warehouse, Transportation, and Utilities; FIRE=Finance, Insurance, and Real Estate

According to the 2011-2015 American Community Survey 5-year Estimates the City of Puyallup has a 59.4 percent employment rate. Major employers in the city include the Puyallup School District, Multicare/Good Samartan Hospital, Fred Meyer Distribution Center, Comcast Cable, Costco Wholesale Store, Wal-Mart, CSK Automotive Distributors, Fred Meyer, City of Puyallup, and Western International Review Board.

Income

Income levels in the City of Puyallup have continued to increase since the 2006 FEIS, from a median household income that was $47,269 in 2000 to a current median household income of $63,376 (Table 9).

Table 9. Income Characteristics — City of Puyallup

	2000		2015	
	Median Household Income	**Per Capita Income**	**Median Household Income**	**Per Capita Income**
City of Puyallup	$47,269	$22,401	$63,376	$31,535

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates

Tax Revenue

Tax revenue generated from economic activity in the City of Puyallup plays a major role in revenues for the City's general fund. Table 10 shows the revenue sources for the city's general fund. Sales tax alone accounts for 55 percent of the general funds total revenues.

Table 10. General Fund Revenue Sources—City of Puyallup		
Source	**Amount (in millions of dollars)**	**Percent**
Sales Tax[1]	$18.44	55.0 %
Property Tax[2]	$8.41	25.1 %
Miscellaneous	$1	3.0 %
Photo Enforcement Fines & Forfeitures	$1.63	4.9 %
Municipal Court Fines & Forfeitures	$0.87	2.6 %
Admission Tax[3]	$0.96	2.9 %
Electric-Private Utility Tax [4]	$0.84	2.5 %
Utility Tax -Wastewater Utility	$0.74	2.2 %
.01% Criminal Justice Sales Tax [5]	$0.62	1.8 %

Source: City of Puyallup 2017 Budget-Top 25 Budgeted Revenue Sources. The General Fund provides and accounts for most traditionally recognized local government functions.
Notes:
[1]. The City of Fife portion makes up approximately 13.75% of the total bill received by property owners.
[2]. The City's effective sales tax rate is 9.9% with .84 cents for every dollar going directly to the city.
[3]. This is a 5% tax collected on all paid admission for any event held within the City of Puyallup.
[4]. The City of Puyallup collects tax on businesses furnishing utilities within the city.
[5]. A portion of the city's sales taxes are allocated towards criminal justice and feed into the general fund.

Transportation

Freight movement in Puyallup occurs primarily via the three state routes that serve the City; SR 161, SR 167 and SR 512. SR 512 is a grade-separated freeway throughout the entire extent of the City. SR 167 (existing River Rd.) connects Puyallup with the Port of Tacoma to the west and to a heavy industrial corridor north of Sumner. SR 161 connects SR 512 with the City's South Hill Center and points south of the City. Valley Avenue is another major arterial that serves Puyallup's main industrial zone north of the Puyallup River.

City of Milton

Land use

A small northeast section of the project study area west and south of Porter Way along I-5, and also the existing 70th Avenue bridge and the Interurban Trail, is within the City of Milton. Consistent with the 2006 FEIS, the existing land use in this area is primarily single-family residential, commercial, and vacant land. The single-family homes are located on fairly large lots, with multifamily development creating a buffer to the commercial corridors along I-5 and SR 99. Figure 5 shows the SR 167 Project Phase 1 alignment within the City of Milton. As shown, there has been no major land use development and conditions are similar to those in 2006.

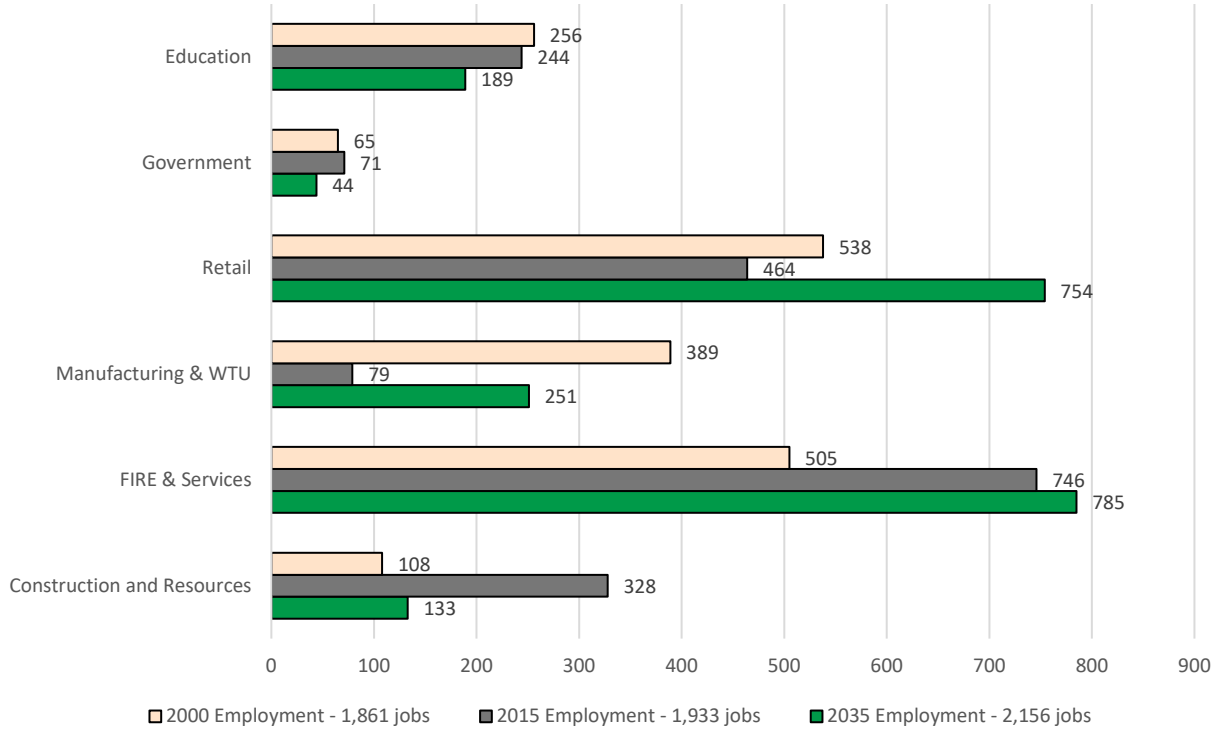
The land adjacent to the Phase 1 Improvements is currently zoned as Light Manufacturing District and Business District. The City of Milton has one development project in review near the SR 167 Project alignment, the Telecare Residential Facility located at 7224 Pacific Highway East. The development includes construction of a 12,000-square foot, 16-bed residential healthcare treatment facility.

Economic Activity

As was the case in 2006, the total employment in the City of Milton is quite small when compared to other jurisdictions along the project corridor with only 1,933 jobs in 2015. This number is projected to increase to 2,156 jobs in 2035, an 11 percent increase. Current and projected employment by industry sector are presented for the City of Milton in Figure 10. Similar to Pierce County, the majority of jobs in Milton in 2015 were in the finance, insurance, real estate, and services sector. Projections for 2035 show this industry sector remaining a strong area for jobs. The highest job growth in Milton is projected to be

in the manufacturing and wholesale trade, transportation, and utilities sector, followed by the retail sector. It is also anticipated that jobs in the areas of construction and resources, government, and education will all experience decreases in 2035.

Figure 10. Past, Current, and Projected Employment by Industry Sector—City of Milton



Source: Puget Sound Regional Council, Seattle, WA - 2015 Covered Employment Estimates by Jurisdiction; Land Use Vision Version 1 (LUV.1) Dataset
WTU=Warehouse, Transportation, and Utilities; FIRE=Finance, Insurance, and Real Estate

Income

Income levels in the City of Milton have continued to increase since the 2006 FEIS, from a median household income that was $48,166 in 2000 to a current median household income of $66,050 (Table 11).

Table 11. Income Characteristics—City of Milton

	2000		2015	
	Median Household Income	**Per Capita Income**	**Median Household Income**	**Per Capita Income**
City of Milton	$48,166	$22,400	$66,050	$33,950
Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates				

Tax Revenue

Tax revenue generated from economic activity in the City of Milton contributes to the City's general fund. Table 12 shows the revenue sources for the city's general fund. Sales tax makes up 21 percent of the general funds total revenues.

Table 12. General Fund Revenue Sources—City of Milton

Source	Amount (in millions of dollars)	Percent
Property Tax[1]	$1.233	30.4 %

Table 12. General Fund Revenue Sources—City of Milton		
Source	**Amount (in millions of dollars)**	**Percent**
Local Sales Tax[2]	$0.85	21.0 %
Other Taxes[3]	$1.26	31.2 %
Licenses & Permits	$0.21	5.2 %
Total State and Federal Funding	$0.09	2.3 %
Total Charges for Services	$0.20	5.0 %
Total Fines and Forfeitures	$0.15	3.8 %
Total Miscellaneous Revenues	$0.05	1.2 %

Source: City of Milton 2017 Budget-General Fund
Notes:
[1] The City has authority to levy $1.60 per $1,000 assessed valuation for its own purposes.
[2] The sales tax in the City of Milton is 9.9%
[3] The City of Milton also collects additional taxes such as criminal justice sales tax, public safety sales tax, gambling tax, utility tax, leasehold excise tax, and liquor excise tax.

Transportation

Interstate 5 and State Route 99 (Pacific Highway) intersect the City's western portion, and State Route 161 (Meridian Street East) creates the City's eastern most boundaries. Milton Way is the primary east/west route through the City and intersects the City Town Center. These corridors serve both local and regional needs. The City has designated Milton Way as a truck route from 20th Street E. to Meridian Avenue E. Pacific Highway E. and Meridian Avenue E. serve as Milton's north-south freight corridors. Trucks also use arterial roadways that connect to industrial and commercial areas.

City of Edgewood

Consistent with the 2006 FEIS, the SR 167 Project's Phase 1 alignment does not travel through Edgewood but will provide a key connection for the N. Meridian Avenue. The current land use in the City of Edgewood adjacent to the study area in the vicinity of Freeman Road and N. Meridian Avenue is primarily residential. Zoning in this area is Single-Family (low and moderate) and Mixed-Residential (low and moderate). Figure 6 shows land uses in the southern portion of Edgewood are still primarily agriculture.

Pierce County

Adjacent to the cities of Fife and Tacoma east of 54th Avenue East, a small portion of unincorporated Pierce County lies within the study area. This includes land bound by 62nd Avenue East on the west, SR 99 to the south and Hylebos Creek on the northeast. This area consists mainly of single-family residential and vacant land with commercial land use along the north side of Pacific Highway. This is an older neighborhood of small lots located between Hylebos Creek and 62nd Avenue East. Zoning is designated as Moderate Density Single Family and Mixed-Use District by Pierce County. Located directly north of the bluffs above Hylebos Creek is Fife Heights, a largely residential community with a rural character.

The SR 167 Project's Phase 1 Improvements cross two additional areas of unincorporated Pierce County, one bounded by Freeman Rd E and 86th Ave E, south of Valley Ave E and north of Levee Rd E; and a second in the "North Puyallup" area east of Milwaukee Ave E, encompassing the SR 167/SR512 interchange. These areas are identified on Figures 5 and 8. The first area contains a mix of single-family residences and industrial development. The area is zoned as Employment Center. The second area is primarily residential with a few small-scale industrial uses. This area is zoned for high density single-family uses. No major land use changes have occurred since 2006.

Puyallup Tribal Trust Lands

Puyallup Tribe of Indians PTOI) "Trust Lands" within the study area are shown on Figure 11. The Puyallup Tribe of Indians Settlement Act of 1989 provided for the settlement of land claims, and the resolution of certain issues of governmental jurisdiction, of the Puyallup Tribe of Indians in the State of Washington, and for other purposes. The settlement was reached with the Puyallup Tribe of Indians and a number of agencies that acknowledges the Tribe as a distinct group with a unique culture and an autonomous governing body. As part of the settlement, the Tribe received some properties and the right to place other Tribal owned lands into "Trust", a classification similar to reservation status. Lands placed in Trust do not pay school district or governmental taxes. However, the Tribe is required to consult with the cities prior to major development proposals on these lands. A special provision of the agreement requires the Tribe to compensate cities for services to Trust lands. The largest tracts of Trust lands are located in the southern portion of Fife and are generally undeveloped at this time.

Tribal Trust Lands in the study area are located north and south of Valley Avenue between 70th Avenue East and 82nd Avenue East, as well as in the Port of Tacoma/Fife area north of I-5. Trust Lands located within the vicinity of the proposed SR 167 Phase 1 alignment includes eight parcels of land (41 acres) west of the proposed project Right of Way (ROW) and east of 70th Avenue East, two parcels (15 acres) southwest of the proposed ROW at the intersection of Freeman Road and 48th Street, one parcel south of the proposed ROW on 8th Street East at 54th Avenue East (0.34 acre), one parcel north of the proposed ROW on 4th Street East at 54th Avenue East (.034 acre), and two parcels east of 62nd Avenue East and south of 12th Street East (5 acres).

Since publication of the 2006 FEIS, the PTOI have purchased the Dekeyser Farm property (approximately 100 acres) south of the Burlington Northern Santa Fe (Union Pacific Railroad) railroad tracks and west of Freeman Rd and east of 70th Avenue East.

4. Would the Phase 1 Improvements result in any new or significant impacts?

During Construction

Property Acquisitions

The Phase 1 Improvements would not result in any new or significant property acquisition impacts. The Phase 1 Improvements would result in an estimated 516 acres of property acquisition as compared to between 500 and 543 acres estimated in the 2006 FEIS. As was the case in the 2006 FEIS, a number of commercial and agricultural properties would be acquired for ROW purposes under the SR 167 Project's Phase 1 Improvements. ROW acquisitions would affect properties within the cities of Tacoma, Fife, Milton and Puyallup as well as a few pockets of unincorporated Pierce County. Some ROW acquisition within Edgewood north of Valley Avenue East may be necessary, depending upon the SR 167 Project's ultimate need for compensatory wetland mitigation. The 2006 FEIS estimated that a total of 286 to 306 acres would be needed for roadway ROW and an additional 214 to 237 acres would be needed for the Riparian Restoration Program (RRP). As shown in Table 13, these estimates remain consistent for what is needed for the Phase 1 Improvements. Since the ROD was issued in 2006, WSDOT has proceeded to acquire approximately 70 percent of the property identified for the Phase 1 alignment (Figure 11). Those properties that are now owned by WSDOT are for the most part vacant or are being leased on a year-to-year tenancy basis for farming purposes.

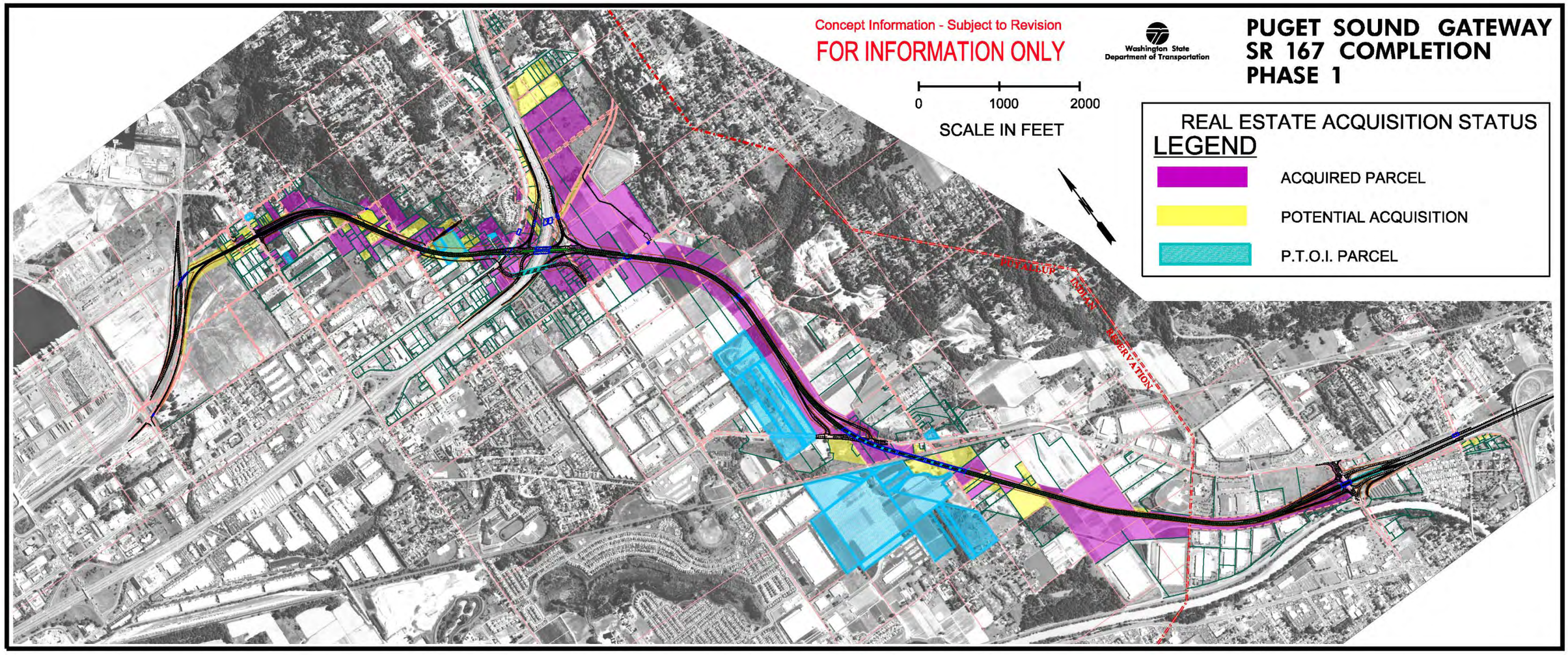


Figure 11. Vicinity Map – Parcel Acquisition Status and Puyallup Tribal Trust Properties

Table 13. Property Acquisition Comparison						
	Residential (acres)	**Commercial/ Industrial (acres)**	**Agricultural (acres)**	**Vacant (acres)**	**General/Public (acres)**	**Total (acres)**
2006 FEIS						
2006 FEIS (ROW)[1]	42-48	40-43	91-112	95-105	9-11	286-306
2006 FEIS (Riparian Restoration)	48-59	25-26	59-71	51	31	214-237
2006 FEIS Totals	**90-107**	**65-69**	**150-183**	**146-156**	**40-42**	**500-543**
Phase 1 Improvements						
Property Acquired since 2006 (ROW)[2]	27	17	173	36	0	253
Future Property Acquisitions (ROW)	13	36	47	21	5	122
ROW Totals	40	53	220	57	5	375
Property Acquired since 2006 (Riparian Restoration)[2]	16	3	41	47	0	107
Future Property Acquisitions (Riparian Restoration)	3	6	13	6	6	34
Riparian Restoration Totals	19	9	54	53	6	141
Phase 1 Improvements Totals	**59**	**62**	**274**	**110**	**11**	**516**

Notes:

1. It was noted in the 2006 FEIS that the final acreage purchased by WSDOT for ROW will be higher because the remainder of some parcels would be rendered unusable. The decision to purchase the remainder of a parcel would be made on a case-by-case basis and could not be determined at that time. Page 3-288 of the 2006 SR 167-Puyallup to SR 509 Tier II FEIS.
2. Data as of January 2018

A short segment of the project corridor, ramp connections from the SR 509 Spur to SR 509, is located in the city of Tacoma requiring the acquisition of a few large vacant parcels. However, the majority of the project corridor (approximately 3 miles) would be located in the City of Fife. A large portion of the ROW needed within the City of Fife has already been acquired. Properties still needed for ROW are located along 53rd Ave E and 54th Ave E, at the I-5 interchange, and near the proposed Valley Ave E interchange (see Figure 11). Currently these properties are primarily being used for commercial purposes.

As discussed previously, the proposed SR 167 Project corridor crosses through several pockets of unincorporated Pierce County. A few of the properties in these pockets are still needed for ROW.

Most of the eastern 2.5 miles of the project corridor would be located in Puyallup, and most of the needed ROW has already been acquired by WSDOT. The properties that still need to be acquired are primarily residential and are located along the project corridor between Freeman Rd E and 86th Ave E. Those properties that will be acquired in the future are predominately residential and agricultural. Table 13 summarizes the breakdown as disclosed in the 2006 FEIS and compares it to current conditions

Commercial Relocations

The Phase 1 Improvements would not result in any new or significant commercial relocations. The Phase 1 Improvements would result in an estimated 19 commercial relocations as compared to 28 estimated in the 2006 FEIS. The Phase 1 Improvements would result in the acquisition of fewer commercial properties and the relocation of fewer businesses than estimated for the 2006 FEIS Build Alternative. An estimated 19 businesses and their employees would be displaced as part of the Phase 1 Improvements, 5 have already been acquired with 14 remaining to be acquired. These displacements would not affect

the regional economy given that the businesses are service oriented, and because the types of businesses are common in the project area, similar commercial space (as well as employment opportunities) exist nearby. Retail and industrial (warehouse) space would be the two types of commercial space needed for relocation.

The Phase 1 Improvements would not affect the regional economy, except through beneficial effects of transportation efficiency in the SR 167 corridor. Overall the effects from investments in transportation infrastructure would be beneficial to businesses and consumers because of improved accessibility. Factors that influence accessibility include travel times, safety, and the transportation choices available to users. In particular, businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit.

Puyallup Tribal Trust Lands

The Phase 1 Improvements would not result in any new or significant impacts to Puyallup Tribal Trust Lands. The Phase 1 Improvements would affect six tribal parcels as compared to the twelve identified in the 2006 FEIS. The six Puyallup Tribe of Indians' parcels are currently located within or adjacent to the proposed project ROW and will require either access rights or fee acquisition. All of the six Tribal parcels are identified through the Pierce County Assessors online database as being in Tribal Trust. Figure 11 shows the Tribal parcels, but some of the parcels are adjacent to each other and show up as a solid block. Of the six parcels, one falls within the proposed SR 509 Spur mainline while the other parcels are abutting to the proposed mainline and would require securing access rights.

After issuance of the Tier I ROD in June 1999, the PTOI purchased two parcels in the vicinity of 12th Street East that will be impacted by the alignment. In October 2007 the PTOI purchased the Dekeyser Farm (approximately 100 acres), which is now designated as Trust Land. As a result, the alignment of the Phase 1 Improvements was shifted to the north to avoid direct property impacts and will only be impacted by the elimination of access from Valley Avenue that includes an at-grade crossing of the UPRR. Access to these parcels would remain through their existing access off Freeman Road.

Property Tax Revenue

The Phase 1 Improvements would not result in any new or significant impacts to property tax revenue. The Phase 1 Improvements would acquire a similar amount of property, with a similar amount of property tax loss as identified in the 2006 FEIS. As discussed in the 2006 FEIS, there would be short-term impacts on the tax base due to ROW acquisitions and the potential loss of retail sales tax revenue if displaced businesses relocate to another jurisdiction. However, it is anticipated that the vast majority of lost revenue would be recovered as vacant land is developed or as the remaining land from displaced users is redeveloped.

The project corridor is predominantly zoned for industrial/commercial and property values are not expected to decline over the long-term as result of the roadway improvements. Residential property values within the study area are equitable and stable compared to local markets. Due to the fact that the new corridor is located on properties zoned for commercial and industrial use, the roadway is unlikely to impact the market negatively. Since freeway proximity and access are important attributes for commercial business, existing residential, industrial, and commercial properties will likely increase in value as the potential for commercial development increases.

The proposed Phase 1 Improvements close proximity to the Port of Tacoma and Port of Seattle, which together form the fourth-largest gateway in the United State for container cargo, make the area appealing to port related warehouses and manufactures. Industrial and commercial property values along the development corridor are anticipated to increase as new developments and relocations compete for the small amount of available frontage space along the existing highway corridors (I-5 and SR 99). Commercial properties within the project corridor are valued from $1.36 to $46 per square foot for vacant commercial land in during the time period of 2015-2018. Improved commercial properties

within the project corridor characteristically bring between $85,000 to more than $6,800,000 per site. Properties closest to the I-5 corridor typically demand the highest value.

The effect on property tax revenue would be offset by the improved traffic flow and increase in accessibility for properties within the overall travelshed. As a result, the cities will likely experience indirect increase in tax revenues to the extent that businesses grow or relocate and new businesses are created.

Sales Tax Revenue

The Phase 1 Improvements would not result in any new or significant impacts to sales tax revenue. The Phase 1 Improvements would relocate fewer businesses than were estimated in the 2006 FEIS. Four businesses located along I-5 and SR 99 would be displaced within the city of Milton and nine businesses would be displaced within the city of Fife. The loss of these businesses would result in a decrease to the City's sale tax revenue if displaced businesses relocate to another jurisdiction. Table 14 indicates that displaced businesses are within the retail trade, wholesale trade, manufacturing and FIRES and Services sectors. Employment within each of these sectors is projected to increase as indicated in Figures 7 and 10.

Table 14 Businesses by Industry Sector

Description	City of Fife Affected Businesses	City of Milton Affected Business
Education	-	-
Government	-	-
Retail Trade	1	3
Wholesale Trade	1	-
Manufacturing	4	1
FIRES and Services	3	-
Construction and Resources	1	-

Sales tax revenue contributes to 32 percent of the City of Fife's general fund and 21 percent of the City of Milton's general fund (Tables 7 and 11). According to the Washington State Department of Revenue there are over 1,800 individuals or companies licensed to do business in the City of Fife and approximately 850 individuals or companies licensed to do business in the City of Milton. Table 14 indicates that the largest amount of taxable retail sales within both jurisdictions come from the retail trade industry sector.

Table 15 Taxable Retail Sales by Industry Sector

Sector	City of Fife	City of Milton
Education	$253,661	$43,340
Government	$18,733	$0
Retail Trade	$643,395,617	$51,261,593
Wholesale Trade	$85,819,755	$6,544.788
Manufacturing	$5,432,779	$2,036,062
FIRES	$35,447,064	$2,135,875
Service Sector	$106,114,683	$29,931,609
Construction and Resources	$71,596,540	$8,759,732

Washington State Department of Revenue (2018)

Because the amount of retail sales tax generated by the displaced businesses is not publicly available it is difficult to quantify the actual effect. However, it is estimated that the vast majority of lost revenue would be recovered assuming businesses would relocate within the local area, particularly along the I-5 corridor (Fife and Milton). As was indicated for the property tax revenue, it is anticipated that the loss in sales tax revenue will be short-term and that the economic revenue would be recovered as the remaining vacant property is developed or as the remaining land from displaced users is redeveloped. The City of Fife's close proximity to the Port of Tacoma, the fourth largest gateway for containerized cargo in the United States when combined with the Port of Seattle, makes it appealing to port-related warehouses and manufactures. As such, the businesses immediately adjacent to the proposed SR 167 Project alignment are expected to experience economic benefits due to the new freeway availability as well as to the proximity of the port. Displacements, disruptions, and relocations are discussed more fully in a separate Technical Memorandum.

Construction-Related Employment

The Phase 1 Improvements would not result in any new or significant impacts as a result of construction-related employment. As was indicated in the 2006 FEIS, the Phase 1 construction is expected to result in both long- and short-term employment impacts in Pierce County. The employment generated by the Phase 1 Improvement's construction activity has been estimated using an economic multiplier measuring the ratio of employment to construction value. Short-term construction-related employment has been estimated using the 2007 FHWA employment impacts of highway capital expenditures estimates; one construction oriented job is created for each $97,087 of highway investment; one supporting industries' job is created for each $213,904 of highway investment; and one induced employment job for each $66,251 of highway investment (FHWA 2010).

During construction, spending is anticipated to increase demand for construction materials and jobs. These expenditures could increase the output (for example, of concrete) of firms and industries which provide the demand for inputs (for example, sand) to the construction industry. In addition, wages paid to workers in construction trades or supporting industries are anticipated to be spent on other goods and services in their local communities and the region. Workers generally spend their incomes on goods and services in the communities in which they live. This localized spending would generate local and state sales and use taxes over the entire construction period.

The Phase 1 Improvements are estimated to cost approximately $849 million over an estimated 11-year period given construction is anticipated to occur in Stages, extending from approximately 2019 - 2030. In applying the ratio of one job for every $97,087 of construction activity, over an 11-year period a demand for 795 direct, temporary construction-related jobs per year will result from the construction of the project. Based on the ratio of one supporting industry job for every $213,904 of construction activity, an additional 361 supporting jobs could be expected during each year of the construction. However, construction-related jobs are generally not considered new jobs in the local economy. This estimate of employment is likely to reflect a reallocation of construction labor activity within the greater Puget Sound region and should not be construed as an estimate of new jobs.

The overall effect of construction and job reallocation in the project area will have a positive impact on the local economy as well. The project will create temporary induced employment for Pierce County and adjoining county residents, and benefit local/regional economies as these earnings are expended for goods and services. In applying the ratio of one job for every $66,251 of construction activity, over an 11-year period a demand for 1,165 induced jobs per year will result from the construction of the project.

Permanent employment impacts will be minimized through the relocation process. Although displacement of some businesses is anticipated, no employment loss is estimated. In some cases, commercial enterprises operate from more than one location. Displacement may require some of the employees working within the project impact area to be reassigned to neighboring work sites.

Some businesses located within the project area along the I-5/SR 99 corridor depend upon their proximity to the I-5 corridor and high visibility for product display. ROW impacts may create a loss of commercial frontage space resulting in a decrease of parking and display/showroom space.

With construction of the Phase 1 Improvements, agricultural employment is anticipated to decline due to permanent loss of land currently in agricultural use. While these operations employ anywhere from two to ten farmhands, the vast majority of the work is seasonal, and the farmhands are not employed year-round. It is typical for seasonal farmhands to migrate from one agricultural region to the next depending upon regional weather conditions and the timing of sowing and harvesting crops.

Temporary Travel Disruptions

The Phase 1 Improvements would not result in any new or significant disruption to travel. As was indicated in the 2006 FEIS, access to businesses and residences throughout the study area would remain open or a detour would be provided during the construction period. The majority of the Phase 1 Improvements will be constructed utilizing alternating lane and shoulder closures to establish required work zones. The duration of these lane and shoulder closures are anticipated to range between two weeks and nine months with some of the lane and shoulder closures occurring at night to minimize disruption to daily traffic operations. It is also anticipated that weekend closures of intersections will be required in order to construct the necessary improvements. The weekend intersection closures are anticipated to range from one weekend to up to four weekends depending on the complexity of the intersection improvements. It is also anticipated that weekend closures of arterial and highway segments will be required in order to construct superstructure over the roadway. Detours would be utilized as needed to minimize disruption to traffic operations. On I-5 it is anticipated that construction of the proposed structures over I-5 will occur utilizing nightly weekend lane reductions and crossovers. The duration of I-5 lane reductions and crossovers are anticipated to occur over four to six weekends.

Travel along segments of the project corridor could be slowed due to construction traffic delivering materials, which may cause some businesses to notice a downturn in their customer base. The vast majority of temporary construction impacts will occur along the I-5 Corridor. Businesses in this section of the project area have primary access located along 54th Avenue East and SR 99. While access to these businesses will not be directly impacted by construction, added congestion from construction traffic in the area may inconvenience customers with longer wait times due to increased volumes.

In the northern project area near I-5, businesses are predominantly industrial or warehouse type businesses providing service outside of their base of operations. While access to facilitate the transportation of goods and services is important for industrial and warehouse type businesses, they are less likely to be economically impacted during construction than convenience type businesses such as restaurants, gas stations, and mini-marts. Businesses that rely on convenient customer access could experience an economic downturn as customers may choose to avoid construction delays and congestion by patronizing similar businesses outside of the construction zone. Once construction activities have been completed, it is expected that business patterns would return to previous levels.

Once construction is complete, the new proposed SR 167 Phase 1 Improvements in the I-5 vicinity will allow for greater access to/from the Port of Tacoma, allowing industrial traffic to bypass local roads. These will reduce congestion on the local streets and should improve access to businesses.

During Operation

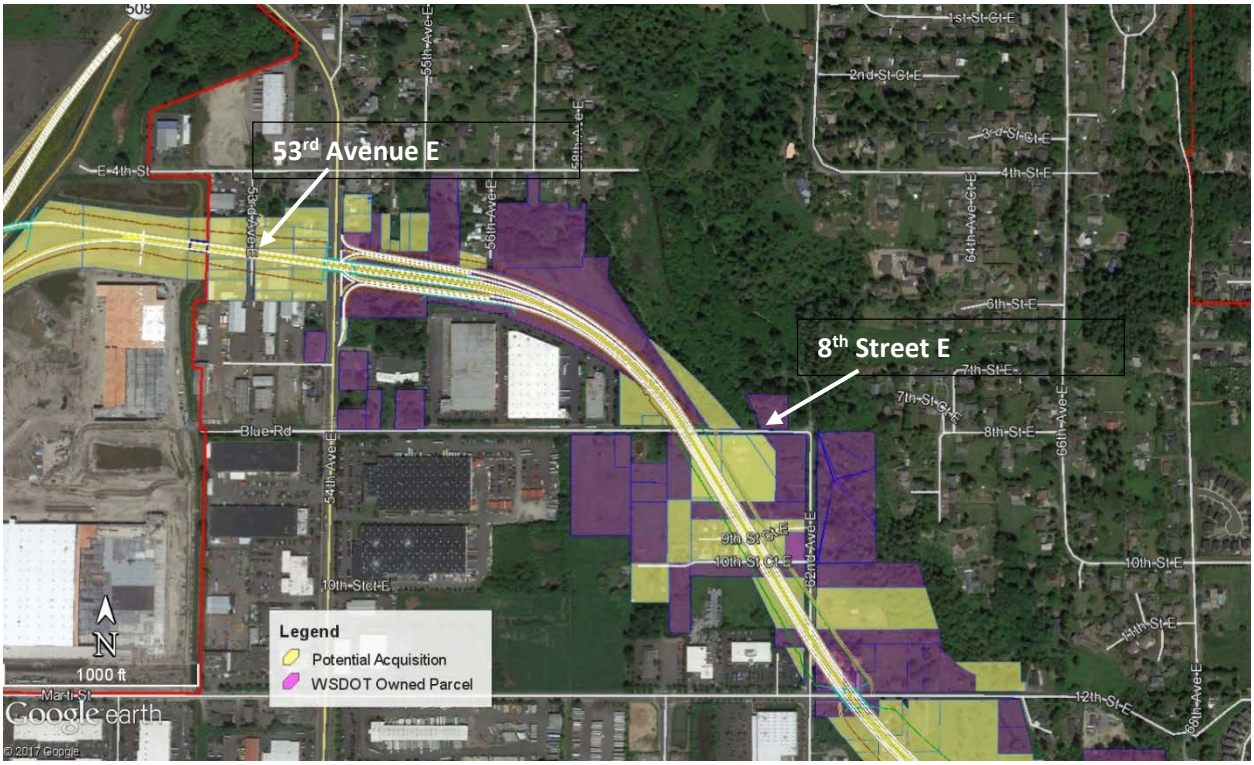
The Phase 1 Improvements would not result in any new or significant impacts during operation. The SR 167 Project's Phase 1 Improvements would not affect the regional economy, except through beneficial effects of transportation efficiency in the SR 167 corridor. Overall the effects from investments in transportation infrastructure would be beneficial to businesses and consumers because of improved accessibility. Factors that influence accessibility include travel times, safety, and the transportation

choices available to users. In particular, businesses that rely on the efficient movement of goods and services (such as business supply companies, service providers, and freight operators) would benefit.

Changes in Local Access

A few local access roadways that currently provide access to land that is either WSDOT owned or anticipated to be acquired for ROW would be cul-de-saced as a result of the Phase 1 Improvements. Two streets, 53rd Avenue East and 8th Street East, will be shortened and a cul-de-sac provided for turnaround. As shown in Figure 12, 53rd Avenue East is a dead-end street and several of the businesses along it would be acquired as part of the project. Similarly, 8th Street East currently connects with 62nd Avenue East; however, once Phase 1 Improvements are constructed 62nd Avenue East will no longer exist north of 12th Street East, therefore a cul-de-sac will be constructed where 8th St. E. intersections the new highway right of way.

Figure 12. Location of 53rd Ave East and 8th Street East in Study Area



Source: Google Earth 2017

Construction of the new 70th Avenue East tie-in to SR 99 is shown on Figure 13. This tie-in will result in the vacation of 65th Avenue East. A three-story building that is located in the southwest corner of this intersection currently utilizes 65th Avenue East to access a parking lot located behind the building. WSDOT's design is being developed, in coordination with the city of Fife, that would provide access to this back-parking lot utilizing the not yet vacated 65th Avenue East right of way.

Figure 13. Location of 65th Avenue East and 70th Avenue East in the Study Area

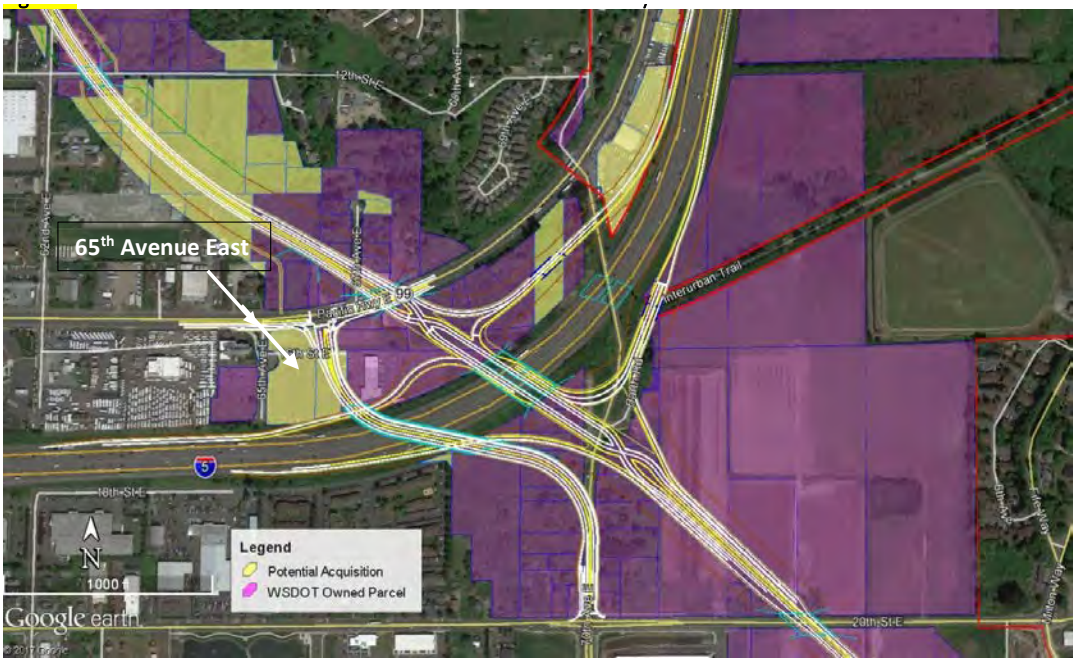
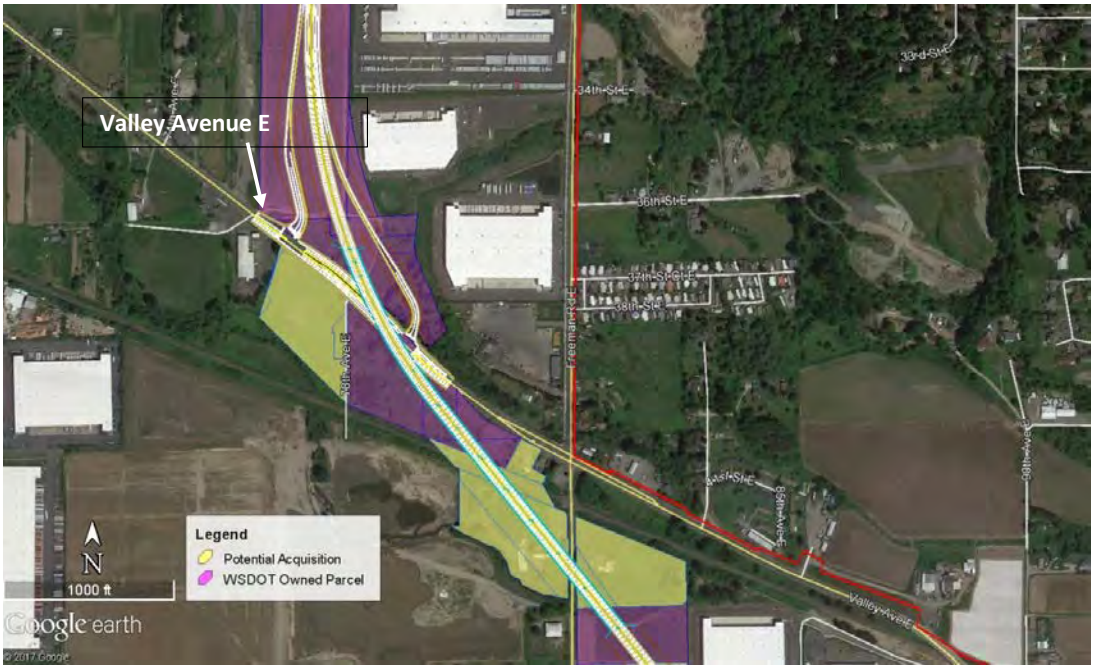


Figure 14, shows a large commercial property located south of Valley Avenue East. A portion of that property will be acquired for the project's future ramps to the south of Valley Avenue East. This property will be impacted by the establishment of limited access along the Valley Avenue East frontage. However, WSDOT's design will ensure enough frontage for a commercial access into the property at the western end of the parcel.

Figure 14. Location of Commercial Property South Valley Avenue East



Source: Google Earth 2017

Currently there is also a roadway bridge over Hylebos Creek on 8th Street East, which pedestrians use to make a loop when walking the Hylebos Creek Nature trail and the Milgard Nature trails. WSDOT's design

will remove that roadway bridge and replace it with a pedestrian bridge so that the loop and walking access to the nature trails is maintained.

Enhanced Mobility for Land uses

The Phase 1 Improvements would not result in any new or significant impacts to mobility for land uses. The completion of new SR 167 Project's Phase 1 Improvements will provide an alternative route, and anticipated shorter travel times for all users. Although the Phase 1 Improvements would increase roadway capacity to a lesser extent than the 2006 FEIS Build Alternative, it would still result in improved reliability of people and goods movement. Extending SR 167 will ease congestion on local arterials and I-5 and improve service between industrial districts by allowing general purpose traffic and trucks to bypass I-5, SR 99 and local streets. Adding this new route will increase the predictability and reliability of deliveries and pickups at warehouses and distribution centers.

The most significant shift in trips would occur along River Road (Existing SR 167) (east-west traffic), Valley Avenue (east-west traffic) and North Meridian north of the SR 167 interchange (north-south traffic). Many trips on these arterials are anticipated to shift to the new segment of SR 167 and the new connection to I-5. The project is also anticipated to cause a slight reduction in trips using westbound SR 512 to gain access to I-5 northbound, as the new extension will provide a better alternative.

The Phase 1 Improvements would draw traffic demand away from nearby facilities, including SR 167 north of Puyallup, SR 161 north of Puyallup, River Road, Valley Avenue, 20th Street East, and 54th Avenue South of I-5. Table 16 shows the Future (2045) AM and PM peak hour traffic volumes on study area roads. In general, the reduction in traffic demand on these facilities and lower levels of congestion would increase mobility in and around the SR 167 Project study area.

Table 16. Comparison of Average Daily Traffic on Key Roadways within the Study Area

Roadway	2045 No Build (both directions)		2045 Build (both directions)	
	AM Peak	PM Peak	AM Peak	PM Peak
54th Avenue E (south of 20th Street E)	1790	1540	1040	980
20th Street E (east of 54th Avenue E)	1640	1670	1040	800
Pacific Highway (SR 99) (west of 54th Avenue E)	1680	2400	980	1570
Valley Avenue E (west of 70th Avenue)	1610	1390	870	970
River Road (SR 167) (east of 30th Avenue E)	1920	1960	1570	1600

Source: SR 167 Transportation Discipline Report

The improvements proposed for Phase 1 of the SR 167 Completion Project are expected to provide similar changes to freeway and local roadway circulation as the Build Alternative assessed in the 2006 FEIS. The SR 167 Phase 1 Improvements will result in decreased travel times for several routes along the corridor, and improved access to a large amount of industrially zoned land, including the Port of Tacoma. The level of congestion on north/south and east/west arterial corridors within the project area would decrease as trips currently made on surface streets divert onto SR 167. Overall mobility along these arterials would improve, resulting in better access to businesses. The SR 167 Phase 1 Improvements will allow trucks to arrive and leave the Port of Tacoma through a limited access route and reduce travel on the congested local street system. This will improve congestion and safety on the local streets considerably.

Travel times to and from the Port of Tacoma and Tacoma City Center area improve most significantly with communities to the east and southeast. The SR 167 Project improves travel times to and from

Puyallup, Sumner, and points east as well as central areas including South Hill, Fredrickson, and Graham. In general, the majority of eastern and central Pierce County communities gain an improved connection with the Tacoma urban center.

Travel times also improve between the Kent Valley and communities along the SR 167 and North Meridian corridor (Sumner, Puyallup, South Hill, Fredrickson, and Graham). Trips that used to use North Meridian north of the SR 167 interchange gain access to I-5 with the new route and are able to reach destinations in the Kent Valley faster.

The SR 167 Project Phase 1 Improvements will also support the Port of Tacoma's competitiveness by making regional freight logistics more efficient. The project will provide increased transportation capacity and a more direct route to meet projected increases in truck traffic resulting from increases in container volumes. SR 167 improvements will allow local firms to more efficiently manage their inventories in the supply of manufacturers or distribution of retail items. It is anticipated there will be faster delivery times, more delivery reliability, and more efficient land use of warehouse space.

The completion of SR 167 Project is also an essential piece of an integrated regional transportation system that supports and improves freight movement to and from the Port of Tacoma through more efficient connections with the rail and road systems. Without the proposed Phase 1 Improvements, the Port of Tacoma (and all Puget Sound ports) would find it more difficult to compete with other U.S. and Canadian ports for the movement of containers. In an environment of intense competition for containerized cargo, an efficient freight mobility infrastructure is an important advantage for the Port of Tacoma. According to a 2007 economic impact study, if the Port of Tacoma does not have a high-quality transportation system that supports the movement of cargo, especially for the containerized cargo that is not destined for Washington State, shippers will quickly shift their business to other ports (Berk and Associates 2007). As road and rail congestion in the I-5 corridor increases over the next 20 years, the impact of increasing traffic levels on the quality and reliability of the freight transportation system will be magnified if needed investments in our highways, railroads, and intermodal facilities do not keep pace, resulting in an increase in the cost of moving freight.

The effects of the Phase 1 Improvements on Port activities are expected to be similar to what was presented in the 2006 FEIS. The Phase 1 Improvements will greatly improve traffic transporting goods and services to and from the Port of Tacoma. Truck traffic will have a direct connection to SR 167 providing an alternative to I-5 north of the project area and the ability to bypass the highly congested interchanges at Port of Tacoma Road and 54th Avenue. Local truck trips to major trucking destinations to the southeast of the Port of Tacoma area will also benefit from the improved connection. AM Peak projected travel time savings for the Phase 1 Improvements in the future (2045) include the following:

- 32% - 48% travel time savings between Port of Tacoma Road and Puyallup
- 24% - 29% travel time savings between Port of Tacoma Road and the Sumner/Pacific Manufacturing Industrial Center (MIC)
- 11% - 16% travel time savings between 54th Avenue and the Kent MIC
- 16% - 19% travel time savings between 54th Avenue and SR 18

With a population of approximately 200,000, Tacoma is the largest city in Pierce County and is its urban, economic, and legislative center. However, Tacoma lacks key transportation connections with a growing number of urban and suburban centers within the county, particularly to the east. Whereas downtown Seattle is directly served by three major highway systems, downtown Tacoma is only directly served by I-5. The new route would increase transportation access and network connectivity to many underserved areas. Currently, there are no direct, limited access east/west highways for residents living along the SR 410 corridor in Sumner, Bonney Lake, Buckley, and Orting that provide access to downtown Tacoma.

The completion of proposed SR 167 Phase 1 Improvements would add additional connectivity and capacity for users of the SR 161 corridor/North Meridian between Puyallup and Tacoma.

The completion of SR 167 Phase 1 Improvements would make Tacoma more accessible to a large portion of Pierce County residents. The increased accessibility could bring positive benefits to the County by connecting Tacoma with population bases in these outlying areas. Businesses in Tacoma could draw from a larger labor pool, while housing in the outlying areas would be more accessible to those working in Tacoma, which could spur additional commercial development in the downtown area.

Consistency with Land Use Plans and Policies

The Phase 1 Improvements would be consistent with local land use plans and policies. As part of this re-evaluation a review of land use plans was conducted to ensure that the Phase 1 Improvements are consistent and are in compliance with the established plans and policies for the affected jurisdictions. Most jurisdictions in the state are required to adopt a Comprehensive Plan consistent with the Washington State Growth Management Act (GMA) governed by RCW 36.70A. Each of the Comprehensive Plans establish policies for community growth and development for a 20-year period and are updated every eight years. The proposed SR 167 Project Phase 1 Improvements are not expected to induce unplanned regional growth, but could alter the rate, timing, and location of development within the corridor area as planned by local and regional jurisdictions.

City of Tacoma

One Tacoma, the City's Comprehensive Plan, was updated in 2015 and builds on the City's 2004 plan, *Tacoma 2025,* and the *Transportation Master Plan*. The plan guides the development in Tacoma over the long term and describes how the community's vision for the future is to be achieved. The completion of SR 167 Project is noted as a top priority in the Transportation Element of the plan. Similar to the findings of the 2006 FEIS, the SR 167 Completion project is consistent with the goals and policies of the current Comprehensive Plan.

The *City of Tacoma Transportation Master Plan* is contained within the Transportation Element of the City's Comprehensive Plan. SR 167 is called out in the Transportation Master Plan as "not a complete freeway between Puyallup and Tacoma. This uncompleted freeway link has been identified as a critical missing link in the State's highway network." There are no specific goals or policies in the plan that directly relate to the Phase 1 improvements; however, completion of the project would help complete the freeway system between Puyallup and Tacoma.

Port of Tacoma

Port of Tacoma Development Planning was addressed in the 2006 FEIS. Since then the Port of Tacoma has adopted in 2012 and updated annually, *The Port of Tacoma Strategic Plan*. This plan guides Port-decision making when investing in assets and builds on existing strengths to ensure long-term future success. The Land Use and Transportation Plan supports the implementation of future business growth, a key goal identified in the Strategic Plan. The SR 167 Project is described in the plan as providing a much-improved connection to key warehousing and trans-loading centers in Fife, Sumner, and Kent.

The Regional and Port Access section of the *Port of Tacoma Land Use & Transportation Plan* lists the following as an action strategy for the Port:

- Provide regional leadership in securing the funds needed to complete SR 167

The completion of SR 167 Project is described as a critical missing link in the state's highway network. For the Port of Tacoma, the completion of SR 167 would "provide a much-improved connection to key warehousing and trans-loading centers in Fife, Sumner, and Kent." WSDOT's proposed Phase 1 Improvements would fulfill the action strategy of the Port and provide them key benefits.

City of Fife

The *City of Fife Comprehensive Plan* (released in 1996, as amended) cited in the 2006 FEIS was updated in 2005 and maintained the 1996 Plan's vision and most of the policies established by that Plan. In 2013 the City of Fife began the process for updating the Comprehensive Plan for the required GMA update and in 2015 adopted the current plan guiding development within the city through 2035. The new plan contains several goals and policies related to the completion of SR 167 Project.

The *City of Fife Comprehensive Plan* contains a number of references to the SR 167 Project. Goal 13 in the Land Use Element of the Plan directs the City to "Where appropriate, encourage a mixture of appropriate commercial, industrial, and office park uses along the SR 167 freeway corridor in compliance with all city concurrency requirements and policies." The following policies from the plan support this goal:

- Policy 13.3, "In compliance with concurrency requirements, once the land is ready for development, encourage plans for commercial and or Business Park, Industrial uses that are compatible with the impacts from the freeway."
- Policy 13.4, "Provide for careful design review on allowed uses along the freeway, some of which could be freeway oriented commercial enterprises as well as those commercial and industrial uses benefitting from visibility and access with the freeway."
- Policy 13.5, "Ensure that any such commercial developments are provided in logical and efficient locations, and help to buffer other development, especially Low Density Residential, from the freeway and other infrastructure."

The purpose and need of WSDOT's SR 167 Project Phase 1 Improvements would be consistent with Goal 13. The project would improve regional mobility of the transportation system to serve multimodal local and port freight mobility between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway (Spur), and the Port of Tacoma. This would support the City's zoning and future land uses along the new SR 167 alignment.

The Comprehensive Plan's Transportation Element also contains references to the SR 167 Completion project Phase 1 as a WSDOT project that is currently unfunded, but anticipated to be complete within the 20-year horizon. The project construction was assumed and taken into consideration in the City's land use and transportation analysis. Policy 4.1 (under the Transportation Goals, Policies, and Implementation Strategies) of the Transportation Element of the plan directs the City to "Work with other agencies in the region to obtain agreements or implement improvements that mitigate adverse impacts of development on traffic conditions within the City of Fife." Implementation 4.1.1 further directs the City to "Work with WSDOT to promote the construction of appropriate highway improvements to help relieve regional and local traffic congestion, including the extension of high occupancy vehicles (HOV) lanes on I-5 through Fife, SR 167 extension to the Port of Tacoma and I-5 interchange improvements at 54th Avenue East and Port of Tacoma Road." WSDOT's proposed Phase 1 Improvements would be consistent with Policy 4.1 and Implementation 4.1.1.

City of Puyallup

The City of Puyallup's Comprehensive Plan (released in 1994, as amended) cited in the 2006 FEIS was last updated in 2015. The Comprehensive Plan presents a broad statement of the community's vision for the future and contains policies primarily to guide the physical development of the city, as well as certain aspects of its social and economic character. The Transportation element of the updated plan contains goals and policies related to the completion of SR 167 Project.

The Land Use Element of the *City of Puyallup Comprehensive* plan describes the SR 167 corridor as one of the three primary state routes for freight movement in Puyallup. SR 167 is a T-2 Freight Corridor which connects Puyallup with the Port of Tacoma to the west to a heavy industrial corridor north of

Sumner. Goal T-1 (under the Transportation Goals and Policies) directs the City to "Proactively develop partnerships to best serve all users of the regional transportation system. The City of Puyallup is not the only body that has a stake in the future transportation system. Neighborhood cities, Pierce County, the State of Washington, and other agencies and organizations play a role in getting around Puyallup…In the coming years, WSDOT will likely be expanding SR 167, this too will have a major impact on travel patterns through Puyallup." The following policy further prioritizes the City to effectively partner with regional players to ensure that the local and regional transportation systems complement one another:

- T-1.1 Promote cooperative inter-agency and inter-jurisdictional transportation planning.
    - (a) Coordinate planning, construction, and operation of transportation facilities with those of other agencies and jurisdictions, including Washington Department of Transportation, Pierce County, and surrounding municipalities.

WSDOT's proposed SR 167 Phase 1 Improvements would benefit the City of Puyallup as well as the region and would therefore be consistent with Goal T-1 and the policy identified above. Additionally, it should be noted that the Transportation Element of the plan and the 2035 design recommendations it provides assumes construction of the new SR 167 route with two lanes in each direction.

City of Milton

The *City of Milton Comprehensive Plan* (released in 1996, as amended) cited in the 2006 FEIS was more recently updated in 2015. The City began the process of updating the Comprehensive Plan, which serves as the City's road-map for future change and growth, towards the end of 2011. The SR 167 Project is briefly noted in the plan. While the completion of SR 167 Project is only included as a planned regional project in the *City of Milton Comprehensive Plan*, the proposed Phase 1 Improvements would help support the following goals and policies from the Transportation Element of City's Comprehensive Plan.

- Goal TR 1, The City shall ensure that transportation facilities and services, needed to support development, are available concurrently with the impacts of such development in order to protect investments in existing transportation facilities and services, maximize the use of facilities and services, and promote orderly compact growth.
- Pol. TR 1.5, The City will coordinate with the appropriate agencies to ensure the efficient movement of goods to serve local and regional markets.
- Goal TR 2, Coordinate with regional transportation entities to ensure maximum connectivity between regional transportation systems and the City of Milton.

City of Edgewood

The City of Edgewood's Comprehensive Plan was adopted in 2015 and looks forward to 2035, providing a vision for the future, identifying goals and policies to achieve that vision, and creating a basis for the City's regulations and guide for future decision making. The Transportation element of the updated plan contains goals and policies related to the SR 167 Project.

The completion of SR 167 Project is briefly mentioned in the Transportation Element of the *Edgewood Comprehensive Plan.* Goal T.II of the plan is to "Develop a transportation system that enhances the delivery and transport of good and services." Policy T.II.a directs the City to "support improved connectivity and access from the City's employment centers to SR 167." It should be noted that the SR 167 Project was not assumed in the plan since it was unfunded at the time the plan was updated; however, the City's past modeling efforts have shown it to positively impact the City of Edgewood. The SR 167 Phase 1 improvements would improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement. This would help support the related goal and policy of the Comprehensive Plan.

Consistency with Regional Plans and Policies

The Phase 1 Improvements would be consistent with regional plans and policies. *VISION 2040*, adopted in 2008, serves as the PSRC's integrated long-range growth management strategy. It builds from the *VISION 2020* plan and expands the focus on sustainability in the incorporation of a projected additional 1.7 million people in the Puget Sound Region by 2040. It promotes the development of a coordinated transportation system that is integrated with and supported by the growth management strategy and builds upon and supports local, countywide, regional, and state planning efforts. Countywide planning policies in each of the counties supply the local framework and provide additional detail for county and city comprehensive plans. *VISION 2040*'s strategies and policies are established within six elements: environment; development patterns; housing; economy; transportation; and public services.

VISION 2040's focus is to contain growth, concentrate new employment in urban centers, and link the centers with a high-quality multimodal transportation system. Per the strategy outlined in *VISION 2020*, the PSRC has designated downtown Tacoma as a regional growth center and the Port of Tacoma as a manufacturing/industrial center. Regional growth centers are envisioned as major focal points of higher density population and employment, served with efficient multimodal transportation infrastructure and services. Regionally significant centers should receive priority in regional and local investments in the infrastructure and services that are critical for supporting growth. Manufacturing/industrial centers (MIC) have a different urban form and purpose than regional growth centers. They are characterized as areas of large contiguous blocks served by the region's major transportation infrastructure, including roads, rail, and port facilities. Good access to the region's transportation system form these centers, in particular, contribute to their continued success. WSDOT's proposed SR 167 Phase 1 Improvements will provide essential transportation infrastructure and help support the regional growth center and MIC designations of downtown Tacoma and the Port of Tacoma.

The *Destination 2030 Metropolitan Transportation Plan* referred to in the 2006 FEIS has been updated since the FEIS was released. The most current version of the PSRC regional plan, *Transportation 2040: towards a sustainable transportation system (Transportation 2040)*, was adopted in 2010 (PSRC, 2010) and updated in 2015 (PSRC, 2015. The new plan is the transportation element of *Vision 2040*, the growth management, environmental, economic, and transportation strategy for the Central Puget Sound region.

One of the issues addressed in *Transportation 2040* that specifically identifies SR167 is related to addressing regional congestion and mobility. *Transportation 2040* states that completing "key roadway projects that would enhance freight mobility, such as…SR 167 extension…" would be important for the region. This acknowledgement is similar to, but more specific than, what was included in the *Destination 2030 Metropolitan Transportation Plan* that was described in the 2006 FEIS. The proposed Phase 1 Improvements would help meet the regional objectives described in *Transportation 2040* in ways that would be similar to, or the same as, those described in the 2006 FEIS for *Destination 2030 Metropolitan Transportation Plan*. *Appendix J: Regional Freight Strategy* of the *Transportation 2040* plan contains a number of references to the completion of SR 167 Project and is identified as one of the key projects for the movement of freight in the region.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Mitigation measures would be the same as described in the 2006 FEIS. WSDOT would continue to coordinate with local jurisdictions and regional authorities to integrate Phase 1 Improvements with other transit-related projects and to minimize unavoidable adverse effects on land uses from the combination of the projects. All applicable federal, state, and local permits and approvals would be

acquired to complete construction of the Phase 1 Improvements and to ensure that the improvements are consistent with local comprehensive plans, zoning ordinances, and other applicable regulations in effect at the time of review.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

Temporary construction effects would be similar to those described for the 2006 FEIS Build Alternative. Effects include loss of local property tax revenue as a result of approximately 520 acres of property acquisitions (as compared to 500 to 543 acres for the 2006 FEIS Build Alternative), relocation of 36 businesses (as compared to 28 for the 2006 FEIS Build Alternative), travel disruptions and changes in access to adjacent land uses, direct and indirect employment related to construction.

As indicated for the 2006 FEIS Build Alternative, it is expected that the loss of property tax and sales revenue would be recovered as the remaining vacant property is developed and the businesses are relocated. In addition, the properties immediately adjacent to the Phase 1 Improvements would benefit due to the improved access.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Mitigation measures are the same as described in the 2006 FEIS. WSDOT would use standard construction mitigation measures for dust, traffic management and visual impacts. In addition, WSDOT would minimize traffic delays by phasing and scheduling construction activities outside of high traffic demand periods as much as possible.

The scheduling of road closures and detour routes will be coordinated with police, fire and emergency services, school districts, and businesses dependent on delivery routes in the active construction area to minimize delay times. Traffic control requirements during construction will conform to state and local regulations. Restricting lane closures and construction that impact traffic during peak commuter hours and peak holiday travel periods should help to ease backups and time delays. Maintaining ongoing communication will keep local residents informed of development phases, areas of construction and possible travel alternatives.

Long-term impacts on tax revenues are expected to be positive and not require mitigation. In the short-term, any reductions in tax base and stagnation in the increase of property values affected by construction could be mitigated through advance purchase of ROW and effective construction phasing and scheduling.

8. Conclusion

With adherence to the regulatory requirements and mitigation measures described above, no new significant impacts to land use and socioeconomics from construction and operation would occur as a result of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. No new or revised mitigation measures would be required.

References

Berk and Associates. 2007. An Economic Assessment of the SR 167 Extension Project

City of Edgewood, 2014. Economic Assessment and Preliminary Strategies. Edgewood, Washington

City of Edgewood, 2015. Comprehensive Plan. Edgewood, Washington

City of Fife, 2009. Fife…The last 10 Years Presentation. Fife, Washington

City of Fife, 2015. City of Fife 2015-2016 Biennial Budget. Fife, Washington

City of Fife, 2015. Comprehensive Plan. Fife, Washington

City of Milton, 2014. 2014 Annual Budget. Milton, Washington.

City of Milton, 2015. Comprehensive Plan. Milton Washington.

City of Milton, 2017. Budget. Milton, Washington

City of Puyallup, 2015. Comprehensive Plan. Puyallup, Washington.

City of Puyallup, 2017. City of Puyallup 2017 Budget. Puyallup, Washington.

Fehr and Peers, 2011. Tideflats Area Transportation Study (TATS) Final Report.

FHWA, 2010. *Employment Impacts of Highway Infrastructure Investment*. https://www.fhwa.dot.gov/policy/otps/pubs/impacts/

Accessed September 2017.

Google Earth, 2017. Map images from 2006 and 2017. Accessed September 2017.

Port of Tacoma 2013. The 2103 Economic Impact of the Port of Tacoma. Tacoma, Washington.

Port of Tacoma 2014. Facilities & Services 2014 Summary. Tacoma, Washington.

Port of Tacoma 2014. Land Use & Transportation Plan 2014. Tacoma, Washington.

Puget Sound Regional Council, December 2009. Vision 2040. Seattle, Washington.

Puget Sound Regional Council, May 2010. Transportation 2040 towards a sustainable transportation system. Seattle, Washington.

Puget Sound Regional Council, 2013. Regional Centers Monitoring Report. Seattle, Washington.

Puget Sound Regional Council, May 2014. Transportation 2040 Update towards a sustainable transportation system Appendix J: Regional Freight Strategy. Seattle, Washington.

Puget Sound Regional Council, 2015. 2015 Covered Employment Estimates by Jurisdiction; Land Use Version 1 (LUV.1) Data Set. Seattle, Washington.

US Census Bureau 2000. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

US Census Bureau 2010. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

US Census Bureau 2006-2010 American Community Survey. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Washington State Department of Transportation, 2017. Environmental Procedures Manual. Olympia, Washington.

Attachments A and B

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements



Displacement, Disruption, and Relocation

COPY TO:	**Project File**
PREPARED BY:	**Steve Fuchs, Project Manager, SR 167 Completion Project**
DATE:	**October 4, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to displacement, disruption, and relocation.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has made moved forward with actions such as the purchase of needed right-of-way (ROW), construction of an advanced wetland mitigation site, completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary

design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed

SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

This project received a Tier 1 ROD in December 1999 that approved the project corridor and allowed early ROW acquisition to proceed to help secure the corridor for the future highway. Consequently, there were several parcels purchased from 2000 thru 2006, prior to the Tier II FEIS. Since publication of the Tier II FEIS in November 2006, WSDOT has continued to acquire property for the ROW and has relocated predominantly residences, but also a couple of businesses that were identified as displacements in the 2006 FEIS. The affected environment relative to displacement, disruption, and relocation described in Section 3.13 of the 2006 FEIS remains applicable to the proposed Phase 1 Improvements. The project area includes land currently in industrial, commercial, vacant/undeveloped, residential, and agricultural use.

Changes to the project footprint as shown in Attachment B have been reviewed and property impacts have been assessed. This memorandum summarizes the changes based on the assessed property acquisition needs through January 15, 2018. Additional property acquisition for Phase 1 will convert existing land uses to transportation-related uses for the highway alignment, and project features such as stormwater facilities, riparian restoration, the relocation of Hylebos Creek, wetland mitigation, etc. The tables below summarize the numbers of residential units, businesses, public, and farm (agricultural use) property displacements from the 2006 FEIS compared to displacements necessary for the Phase 1

Improvements, including any potential acquisitions as of January 15, 2018. Vacant land acquisitions are not included in the tables. Table 2 lists how many properties have been purchased by WSDOT since 2006 (through January 15, 2018), and how many acquisitions remain.

Table 2. Comparison of Displacements - 2006 FEIS Build Alternative vs. Phase 1 Improvements

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm	**Totals**
2006 FEIS						
Highway Alignment	65[1]	21	27[1]	1	1	**115[1]**
Wetland Mitigation and RRP	26	8	3	3	1	**41**
Total	**91[1]**	**29**	**30[1]**	**4**	**2**	**156[1]**
Phase 1 Improvements						
Highway Alignment	74	9	19	5	5	**112**
Wetland Mitigation and RRP	18	8	0	3	0	**29**
Total	**92**	**17**	**19**	**8**	**5**	**141**
Acquired (as of 1/15/2018)	64	0	5	2	4	**75**
Remaining to be acquired	28	17	14	6	1	**66**

Source: 2006 FEIS Table 3.13-1 and Table 3.13-2, and summary of Phase 1 improvement impacts as described in Section 4.

[1]Includes additional units not included in the 2006 FEIS due to an oversight as described in Section 4.

As provided in Table 2 above, there would be fewer displacements caused by the Phase 1 Improvements than for the 2006 FEIS Build Alternative. The slight increase shown for displacements of both "Public" and "Farm" use is most likely due to the criteria used to define each parcel in 2006, compared to the criteria used in 2018 which was based on the current use. The Table also shows an increase in displacements for "Single Family Units." However, there is a decrease in displacements for "Manufactured Home and Multi-family Units," and "Business," as well as a decrease in the total number of displacements, which are 141 total under the Phase 1 Improvements, compared to 156 displacements for the 2006 Build Alternative.

4. Would the Phase 1 Improvements result in any new or significant impacts?

The properties that would need to be acquired for the Phase 1 Improvements are different in some areas compared to acquisitions identified for the 2006 FEIS Build Alternative. This is due to design adjustments of the alignment within the corridor, and the smaller footprint of the Phase 1 Improvements. The following paragraphs describe the Phase 1 impacts to displacement in more detail, and are listed by area in the same sequence as the 2006 FEIS Chapter 3.13.

54th Avenue Interchange area (from SR 509 to 12th St.)

At the 54th Avenue E. interchange, the loop ramp has been replaced with a ½ single point urban interchange to the east of 54th Avenue. In addition, the alignment at this location has been shifted to

the north and consequently there are eleven new impacted properties on the west side of 54th Avenue, consisting of nine businesses, one residence, and two vacant parcels. The nine businesses include Marvin Sheet Metal, two machine shops, Auto-Chlor System, Matheson Gas, the M&A Investments' storage shop, Baydo's RV Service Center, Downing Collision repair, and Canteen Vending Services. The City of Fife owns a vacant residence in this area, and one property owner has a residence on one parcel and his other parcel is vacant industrial land for sale. One additional single-family residential property has already been acquired by WSDOT. On the east side of 54th Avenue, another property owner includes a residence and operates Auto Repair Fife. In addition, there is one residence east of 54th Avenue which may be displaced. Three additional single-family residential properties have already been acquired by WSDOT. The four residential properties acquired by WSDOT were previously identified as part of the 2006 FEIS analysis, however due to an oversight, they were not included in the 2006 FEIS text or in Table 3.13-2.

All seven of the commercial businesses on the west side of 54th Avenue identified in the 2006 FEIS are no longer displaced. An 8th business (Carson Home) on the east side of 54th Avenue may only require a minor access revision compared to a total parcel acquisition described in the FEIS. In addition, the three large OPUS warehouse buildings north of 8th St. will no longer be disrupted under the Phase 1 Improvements.

Right of way will be required for the construction of travel lanes. Nine manufactured home units located in the Hylebos Creek Estates that were identified as impacted in the 2006 FEIS and would continue to be impacted by the Phase 1 improvements and remain to be acquired.

Nine residential single-family homes were identified in the 2006 FEIS to be displaced in the vicinity of 8th St. to 12th St. Six of the nine have already been acquired and the three remaining properties are in the process of being acquired. Ten additional single-family residential properties not identified in the 2006 FEIS will also be displaced, eight have already been acquired by WSDOT, another two are in the process of being acquired.

In summary, nine commercial businesses identified in the 2006 FEIS as being displaced are no longer displaced. In place of those nine, eight new commercial businesses may be displaced. Eighteen single-family residences have already been purchased by WSDOT. Eight single family residences and nine manufactured home units are yet to be acquired. In total, when accounting for the oversight, there would be an additional 13 single family units and two businesses displaced than were identified in the 2006 FEIS analysis in this area. One less public property would be displaced.

Table 3. Comparison of Displacements for 54th Avenue Interchange area (from SR 509 to 12th St.) - 2006 FEIS Build Alternative vs. Phase 1 Improvements

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS[1]	13[1]	9	8	1	0
Phase 1 Improvements	26	9	10	0	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts as described in Section 4

[1]Includes four additional single family units not included in the 2006 FEIS due to an oversight.

I-5 Interchange area (from 12th St. to 20th Street)

The full system level interchange including direct connect HOV ramps described in the 2006 FEIS has been replaced with a service level signal-controlled Diverging Diamond Interchange (DDI). The DDI results in a smaller footprint through the I-5 corridor and allows for a refined 70th Avenue relocation design. As a result, the twelve multi-family residence units in the Mountain View Apartment complex identified in the FEIS will no longer be impacted under the Phase 1 Improvements.

Fourteen commercial business displacements were identified in the 2006 FEIS. Eight of these commercial businesses impacted by the 2006 FEIS Build Alternative are no longer impacted by the Phase 1 Improvements. The eight commercial properties no longer impacted include Java Junkie, Quality Home Enclosures, Heartland Express, Urban Paintball Park, Linwood homes, a Puyallup Tribe of Indians' Tribal Trust property, Acura of Fife, and Selden Furniture. The six commercial properties impacted by the 2006 FEIS and still impacted by the Phase 1 Improvements include King County Auto Auction, the Golden Rule Motel, Freeway Trailer Sales, Blue Dog RV, Kanopy Kingdom and General Trailer Parts.

Phase 1 Improvements would impact nine businesses. As of January 15, 2018, WSDOT has acquired properties which include five of the nine businesses impacted, consisting of Shurgard Mini Storage, Olympic Boat Center, Western Superior Structurals Manufacturing, King County Auto Auction and the Golden Rule Motel. The remaining four businesses to be acquired include Freeway Trailer Sales, Blue Dog RV, Kanopy Kingdom and General Trailer Parts.

Seven residential properties north of I-5 have been acquired for Phase 1 Improvements, the 2006 FEIS identified 4 residential parcels to be acquired.

On the south side of I-5, only one of six residential parcels impacted by the 2006 FEIS roundabout design on 20th Street has been acquired, while the other five are no longer impacted by the Phase 1 Improvements.

The 2006 FEIS identified twenty-one residential properties along 70th Avenue to be acquired. All twenty-one residential properties along 70th Avenue have been acquired.

In summary, a total of two single family units, twelve multi-family units and five businesses identified in the 2006 FEIS will not be displaced as compared to the Phase 1 Improvements. A total of twenty-nine residences, nine businesses, and five public facilities may be displaced with the Phase 1 Improvements around the I-5 interchange area.

Table 4. Phase 1 Improvement Displacements for I-5 Interchange area (from 12th St. to 20th Street)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	31	12	14	0	0
Phase 1 Improvements	29	0	9	5	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts as described in Section 4.

Valley Avenue Interchange area (from 20th Street to Freeman Road)

Near Valley Avenue, the 2006 FEIS identified displacements at six single family units, two businesses and one agricultural property. The Phase 1 Improvements reduce displacement impacts as compared to the 2006 FEIS due to the replacement of the loop off-ramp with a half-diamond interchange to the north of Valley Avenue. Due to this change, one commercial business (Washington Lettuce), three residential parcels, three vacant industrial properties, and one agricultural property are no longer impacted under

the Phase 1 Improvements. The smaller footprint also eliminates impacts to an existing tribal business and a newly acquired tribal property as compared to the FEIS. Two residences have been purchased and one residence remains to be purchased near the Valley Avenue Interchange.

Under the 2006 FEIS and Phase 1 Improvements five residential displacements have been identified along the SR 167 mainline alignment from south of 20th Street to west of Freeman Rd. Four residences have been acquired by WSDOT, and one residence may be displaced. Under the Phase 1 Improvements, five new farm impacts have been identified. Four of these new farms have been acquired by WSDOT, and one new farm remains to be purchased.

In summary, a total of three single family units, and two businesses identified in the 2006 FEIS will not be displaced as compared to the Phase 1 Improvements. There would be a total of four additional farms displaced due to the Phase 1 Improvements as compared to the 2006 FEIS.

Table 5. Phase 1 Improvement Displacements for Valley Avenue Interchange area (from 20th Street to Freeman Road)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	11	0	2	0	1
Phase 1 Improvements	8	0	0	0	5

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts as described in Section 4.

SR 161/SR 167 Interchange area (from Freeman Road to SR 512)

The North Levee Rd to Valley Road connection known as VALE described in the 2006 FEIS is not part of the Phase 1 Improvements. The proposed project maintains the full SPUI at N. Meridian Rd, but does not include any widening of the Puyallup River Bridge. Six residences adjacent to the northbound SR 167 to southbound SR 512 on-ramp identified under the 2006 FEIS may still be displaced by the Phase 1 improvements. Five additional residences between Freeman Avenue and N. Meridian Rd are now anticipated to be displaced under the Phase 1 Improvements. One commercial business identified under the 2006 FEIS is no longer anticipated to be impacted, and three previously vacant industrial parcels have since been developed and are not anticipated to be impacted.

In summary, there would be a total of five additional single family units, and one less business impacted by the Phase 1 Improvements as compared to the 2006 FEIS in the SR 161/SR 167 interchange area.

Table 6. Phase 1 Improvements Displacements for SR 161/SR 167 Interchange area (from Freeman Road to SR 512)

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	6	0	1	0	0
Phase 1 Improvements	11	0	0	0	0

Source: 2006 FEIS Table 3.13-1 and summary of Phase 1 improvement impacts as described in Section 4.

RRP - Mainline SR 509 to I-5 Segment

Seven single family units and eight multi-family residential units were identified in the 2006 FEIS as being displaced. Thirteen single family and eight manufactured homes now need to be acquired along Hylebos Creek as part of the Phase 1 improvements. Of those thirteen single family units, eleven have already been acquired by WSDOT. The two remaining single family units no longer include residences, one has been acquired, and one remains to be acquired. The City of Fife water control station is still anticipated to have some impacts under the Phase 1 Improvements, but is not expected to be displaced.

The eight manufactured homes within the RRP for the SR 509 to I-5 segment together with the manufactured homes identified within the roadway ROW near the 54th Avenue East Interchange (discussed in the 54th Avenue Interchange area above) will displace the entire Hylebos Creek Estates complex. All of the manufactures homes of the Hylebos Creek Estates complex remains to be acquired.

The one business identified in the 2006 discipline report will not be displaced.

Table 7. Phase 1 Improvements Displacements for Mainline SR 509 to I-5 Segment

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	7	8	1	2	0
Phase 1 Improvements	11	8	0	0	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts as described in Section 4.

RRP - Mainline I-5 Interchange Segment

The 2006 FEIS stated there would be nine residential displacements associated with the RRP, however due to an oversight, Table 3.13-2 only listed five. The FEIS also states there will be three businesses displaced due to the RRP, however due to an oversight, the table only lists one. Under the Phase 1 Improvements, there are no longer any businesses that may be displaced due to the RRP around the I-5 interchange area, instead two residences will be acquired. Three new public facilities and one vacant residential parcel impacted by the Phase 1 Improvements remains to be acquired.

Table 8. Phase 1 Improvements Displacements for Mainline I-5 Interchange Segment

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	9	0	3	0	0
Phase 1 Improvements	2	0	0	3	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts as described in Section 4.

[1]Includes four additional single family units and two businesses not included in the 2006 FEIS due to an oversight.

RRP – Mainline I-5 to Valley Avenue Segment and Valley Avenue Interchange

On the segment between I-5 and Valley Avenue, the 2006 FEIS stated that 3 single family units, 1 public facility and 1 farm property would be acquired. At the Valley Avenue interchange, the 2006 FEIS stated that there would be eleven single family residential units and one commercial business to be displaced. One of the residences impacted by the Valley Avenue interchange has been acquired and one more is yet to be acquired, however, impacts from the Phase 1 Improvements is due to the mainline footprint, not the RRP. The other sites are not anticipated to be impacted by the RRP. In addition, the Firwood

Tavern burned down (date unknown) prior to WSDOT acquiring this parcel. In summary, none of the sites identified in the 2006 FEIS and no new additional sites are anticipated to be impacted by the Phase 1 Improvements RRP work.

Table 9. Phase 1 Improvements Displacements for Mainline I-5 to Valley Avenue Segment and Valley Avenue Interchange

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS – I-5 to Valley Avenue	3	0	0	1	1
2006 FEIS – Valley Avenue Interchange	11	0	1	0	0
Phase 1 Improvements	0	0	0	0	0

Source: 2006 FEIS Table 3.13-2 and summary of Phase 1 improvement impacts as described in Section 4.

Wetland Mitigation

No wetland mitigation sites were identified in the 2006 FEIS. Based on the current list of potential wetland mitigation sites, WSDOT anticipates five single family residences would need to be displaced. WSDOT's design effort is still progressing regarding development of the wetland mitigation plan, which may necessitate additional property acquisition beyond the current list of sites.

Table 10. Phase 1 Improvements Displacements for Wetland Mitigation

	Single Family Units	Manufactured Home and Multi-Family Units	Business	Public	Farm
2006 FEIS	0	0	0	0	0
Phase 1 Improvements	5	0	0	0	0

Public Properties

Table 2 indicates eight Public properties will require displacement for the Phase 1 Improvements as compared to four in the 2006 FEIS. These generally include vacant land with no improvements, asphalt parking, or parcels with public works equipment/storage sheds.

One public property includes a portion of the City of Milton's Interurban Trail, which WSDOT intends to relocate, but will maintain connectivity and continued public use, pursuant to U.S. Department of Transportation Section 4(f) requirements. This property acquisition (and required mitigation) is consistent with the 2006 FEIS for the Build Alternative. Additional detail on this property is included in a separate "Section 4(f)" Technical Memorandum.

Farm Properties

Table 2 indicates five Farm properties will require displacement for the Phase 1 Improvements as compared to 2 in the 2006 FEIS. Since publication of the 2006 FEIS, most of the parcels currently being used for agriculture are owned by WSDOT and are being leased. A few farms can also be found as an interim use on properties that have been zoned for residential, commercial, or industrial use. This is

consistent with the 2006 FEIS. There is currently no "Farmland" as defined by the Federal Farmland Protection Act in the Phase 1 Improvements area, or lands zoned for agricultural use. More details are available in a separate "Farmland" Technical Memorandum.

Summary of Impacts

In summary, the impacts described above are generally consistent with the impacts described for the Build Alternative in the 2006 FEIS. The changes resulting from the new proposed Phase 1 Improvements are minor, and do not result in significant new impacts from those described in the 2006 FEIS.

As provided in Table 2 above, there would be fewer displacements caused by the Phase 1 Improvements than for the 2006 FEIS Build Alternative. The Phase 1 Improvements requires additional acquisition of residential properties, public and farm compared to the 2006 FEIS, but reduced the number of manufactured/multi-family units and business acquisitions.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Consistent with the 2006 FEIS, all of the displacements and ROW acquisition impacts for the Phase 1 Improvements are considered construction impacts, i.e., they do not result in operational impacts. Specific mitigation measures for operations phase were not proposed in the 2006 FEIS or ROD, and none are proposed for operations phase under the Phase 1 Improvements. Some future displacements or disruptions may be avoided as design progresses and additional potential mitigation measures are evaluated, including the use of retaining walls and other modifications to reduce ROW requirements. These will be determined during final design.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

Consistent with the 2006 FEIS, construction activities for the proposed Phase 1 Improvements may result in temporary disturbance or disruption of access, parking, landscaping, etc., that does not result in displacement of the associated property.

Regarding displacement, typically after WSDOT acquires a property and relocates the owner and\or tenants, we will secure and monitor the property until the structures and improvements can be demolished. The sooner demolition can take place the better because vacant properties can attract transients and homeless encampments, which may become an additional problem area for local law enforcement. This has become a more pressing problem in the years along the proposed SR 167 Phase 1 alignment since issuance of the 2006 FEIS. There are a few properties that include designated historic structures, which cannot be demolished immediately and have in recent experience been subject to vandalism. In most cases, it is WSDOT's goal to have demolition occur within one month from the date of property evacuation. Other than the issue of vandalism of vacated property, there are no temporary construction effects related to the acquisition and relocation of property owners that would result from the Phase 1 Improvements not already described in the 2006 FEIS.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Consistent with the 2006 FEIS, the Real Estate Services (RES) Office of WSDOT conducts all displacement negotiations as part of the acquisition process. WSDOT will conduct negotiations with each property owner affected. The terms of the acquisition may include relocation assistance if the property owner is eligible. During the relocation negotiations, all reasonable options for minimizing the extent of the displacement are examined. Where ROW acquisition is needed, the acquisition and relocation program is conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970, as amended. Relocation resources are available to all residents and businesses without discrimination.

Federal and state laws require that no person can be required to move from his or her residence unless comparable replacement property is available for sale or rent within the displaced person's financial means. The location and sale price or rent of the comparable property is made available to the displaced individual. Relocation of displaced residents depends on the availability of residences similar in cost and access to services. WSDOT's RES staff review available properties within a 10 mile radius of the proposed Phase 1 Improvements area on an ongoing basis, and have determined more than adequate housing is available for all persons potentially displaced.

For displaced businesses, the benefits can include moving cost reimbursements, re-establishment costs, and fixed schedule moving options. The eligibility of the business for those benefits would be determined at the time of displacement. Construction of the SR 167 Phase 1 Improvements would be accomplished in stages. Since the project has and will have substantial lead-time for each stage, WSDOT RES staff have determined that adequate commercial space for displaced businesses would be available within the vicinity of the proposed project area.

Mitigation measures that would be implemented to minimize construction impacts on residences, businesses, farms, and public facilities include maintaining access to existing uses wherever possible. WSDOT's construction contractor will be required to submit an approved construction plan prior to the start of any field activities. Affected businesses, residences, and other property owners would be notified of construction activities in advance, including any necessary closures or detours, and reasonable efforts would be implemented to minimize traffic disruptions and temporary access revisions during construction. These mitigation measures are consistent with the 2006 FEIS.

Similar to the 2006 FEIS build alternative, the proposed Phase 1 Improvements will be constructed in stages, which focuses the construction work areas and should minimize disturbance to residences and businesses.

Most of the minimization and mitigation measures undertaken for the Phase 1 Improvements will be associated with efforts to minimize disruption to existing businesses during construction of the new freeway and related project features. The contractor will be required to maintain access to all businesses during normal business hours and will also be required to coordinate with said businesses to ensure there is a sharing of information regarding upcoming closures or detours. Similarly, the contractor is also required to coordinate with residences that will be impacted by the access to and from their homes. The above is consistent with mitigation measures described in the 2006 FEIS.

8. Conclusion

No new or significant impacts related to the displacement, disruption, and relocation of property owners would occur because of the proposed Phase 1 Improvements that were not previously identified for the Build Alternative in the 2006 FEIS. While no new or revised mitigation measures would be required, mitigation measures described in the 2006 FEIS and ROD commitments will be implemented during design and construction of the Phase 1 Improvements.

References

SR 167 Tier II EIS Displacement and Relocation Discipline Report (WSDOT, 2004).

SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation, Chapter 3.13 - Displacement, Disruption, and Relocation (WSDOT and FHWA, November 2006).

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Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements Vicinity Map



Farmland

COPY TO:	**Project File**
PREPARED BY:	**Hussein Rehmat, Environmental Planner, HNTB**
DATE:	**July 18, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to farmlands.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future

phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over	Yes	No

the Puyallup River		
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

At the time of the 2006 FEIS, a large portion of the SR 167 project area was actively being farmed. Most of the land being farmed was under short-term lease from property owners that included local owners, development corporations, and the WSU Extension service. According to the 2006 FEIS, those actively farmed lands that were not committed to urban development qualified as “prime farmland” under the Farmland Protection Policy Act (FPPA). Figure 3.12-1 in the FEIS identifies the farmlands at that time. Pursuant to the FPPA, prime farmland as defined by 7 CFR 658.2 is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

As part of the original discipline report (WSDOT, 2004) a Farmland Conversion Impact Rating form was completed and submitted to the Natural Resources Conservation Service (NRCS). The NRCS administers the FPPA and uses a Land Evaluation and Site Assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of Federally funded and assisted projects. The rating score is used by NRCS as an indicator for project proponents to consider alternative sites if the potential adverse impacts on farmlands exceed the recommended allowable level. The eventual final score provided in the 2006 FEIS was below the threshold which would have required further consideration of impacts.

According to the NRCS , land not considered “farmland” under the FPPA includes:

- Land already "developed" or already irreversibly converted, using:
  - US Census urban areas maps;
  - Existing project "footprint" including right-of-way; or
- Land already committed to urban development; or
- Land committed to water storage

Based on this definition, none of the land within the SR 167 project area is currently subject to the FPPA and therefore a LESA is not necessary for this re-evaluation. As shown in Figures 1 and 2, there are a number of properties that were considered farmland in 2006 but have since been converted to industrial uses. These properties are located primarily beyond the SR 167 footprint. The properties located within the SR 167 footprint that are currently being used for agricultural purposes are also shown on Figures 1 and 2. Many of these properties are now owned by WSDOT and leased to farmers on a year-to-year tenancy basis. At this time, there are nine WSDOT-owned parcels that total 123 acres currently under lease to Sterino Farms within the SR 167 project ROW. Another 6 parcels that total 26.2 acres of agriculture land is currently privately-owned and will be acquired for right-of-way purposes. As described in the 2006 FEIS, the soil in the project area is suitable for a wide range of cultivated crops and is favorable for growing row crops. Rhubarb, lettuce (bib, romaine and red leaf), sweet corn, cucumbers, green beans and berries are the most commonly grown crops in the area. These crops are sold locally as well as through wholesalers to supermarket outlets throughout the region and state.

Similar to what was described in the 2006 FEIS, local area farmers are finding it increasingly difficult to raise crops profitably in this area of rapid urban growth and development where property taxes on the land, now located within city limits, have risen dramatically.

Since historic agricultural farming practices were a dominant part of the local economies of Fife and Puyallup, the cities continue to support agricultural uses until such time as the lands are redeveloped to designated uses. The City of Fife allows farming activities in most zones. However, there are no agricultural designations in the Comprehensive Plan (City of Fife 2015). Instead, Fife preserves the farmers' right to continue farming and assures that they will not be restricted in their continued normal farming practices when development occurs around them. Similarly, the City of Puyallup's Comprehensive Plan (City of Puyallup 2015) notes that in portions of the Urban Growth Area, agricultural lands provide a land base for needed industrial development, served by water, sanitary sewer, railroad spurs, highway and arterial access. It is the City's policy to encourage agricultural production on those lands until such time as conversion for manufacturing and business/research park uses would occur.

The policy framework developed by the cities of Puyallup and Fife acknowledges the historical importance and desirability of agricultural lands. However, the jurisdictions have determined that agricultural land is not considered commercially viable long term and therefore there are no agricultural land use designations in the comprehensive plans.

Some agricultural land along the project corridor falls within Unincorporated Pierce County. The County encourages agricultural activities as an appropriate land use throughout the rural area. The focus for preservation of agricultural lands according to County's comprehensive plan must be on lands not already characterized by urban growth (Pierce County 2016).

No agricultural lands fall within the City of Tacoma, Milton, or Edgewood along the Phase 1 Improvements Corridor.

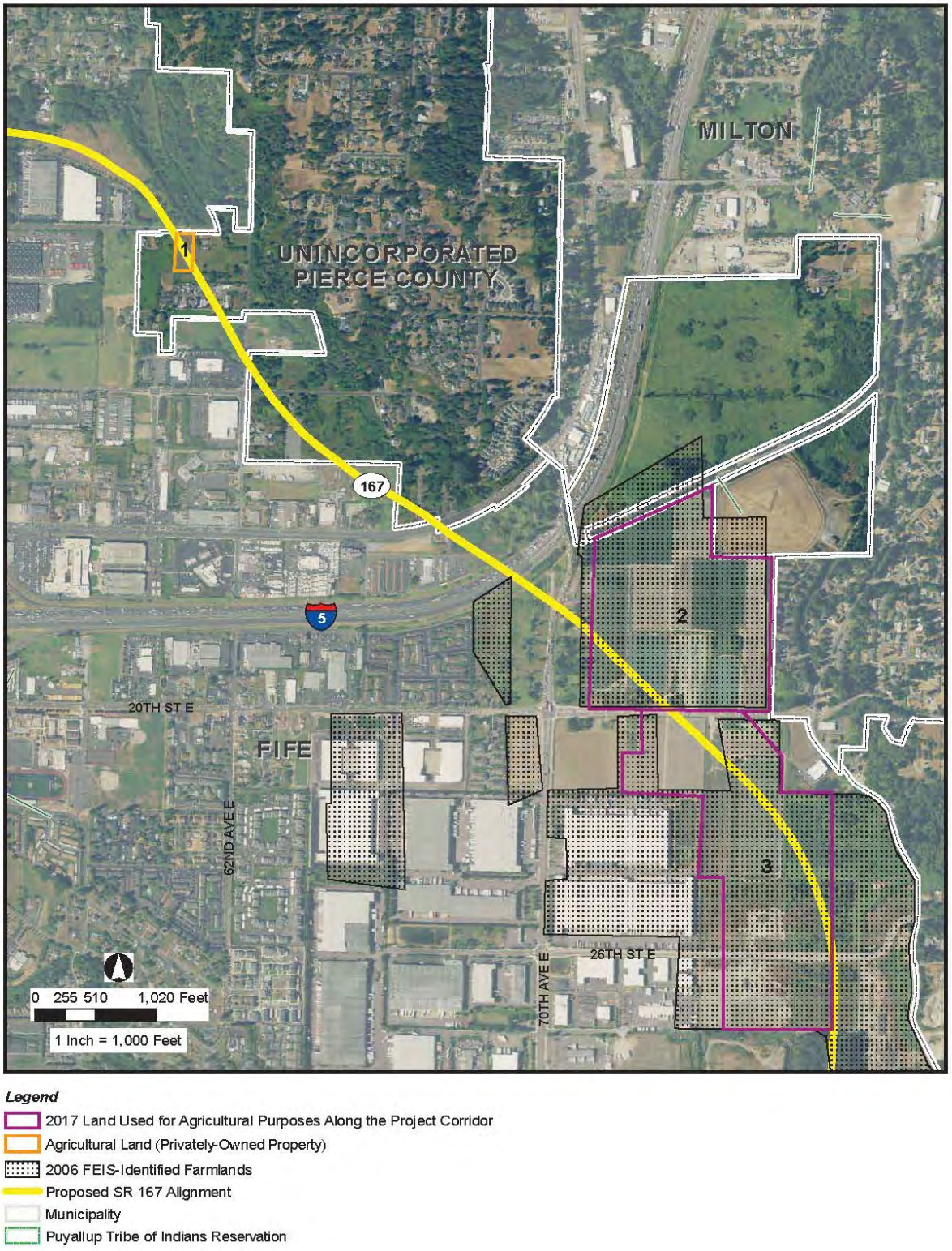

Figure 1. Parcels along the Phase 1 Improvements Corridor Identified as Having Agricultural Use (Map 1 of 2)

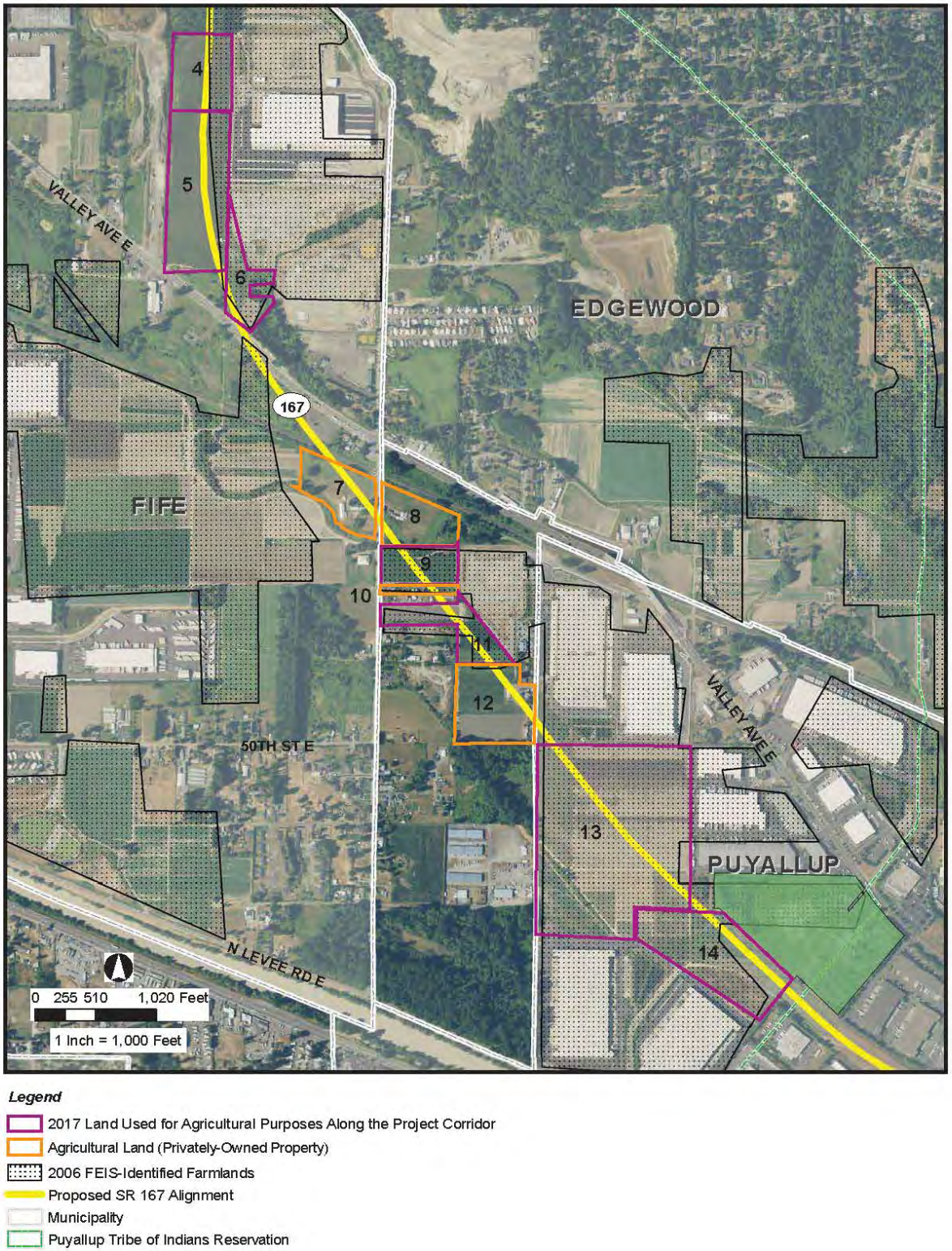

Figure 2. Parcels along the Phase 1 Improvements Corridor Identified as Having Agricultural Use (Map 2 of 2)

4. Would the Phase 1 Improvements result in any new or significant impacts?

The 2006 FEIS indicated that approximately 150-183 acres of farmland would be converted to transportation-related uses or for riparian restoration. [pp. 3-331 of FEIS.] The analysis also indicated that six different farmers would be affected and that the Washington Lettuce and Vegetable Company would be displaced. This re-evaluation indicates that approximately 222 acres of agriculture use property would be converted to transportation-related uses or for the Riparian Restoration Program (RRP) under the Phase 1 Improvements (Table 2). Of this total, approximately 123 acres are already owned by WSDOT and as indicated previously are being leased to one entity (Sterino Farms) on a year-to-year tenancy (Table 3). Another 6 parcels, a total 26.2 acres of agriculture use property, are currently privately-owned and will be acquired for the SR 167 Project ROW.

Table 2. Property Acquisition Comparison by Land Use

	Residential (acres)	Commercial/ Industrial (acres)	Agricultural (acres)	Vacant (acres)	General/Public (acres)	Total (acres)
2006 FEIS						
2006 FEIS (ROW)	42-48	40-43	91-112	95-105	9-11	286-306
2006 FEIS (Riparian Restoration)	48-59	25-26	59-71	51	31	214-237
2006 FEIS Totals	**90-107**	**65-69**	**150-183**	**146-156**	**40-42**	**500-543**
Phase 1 Improvements						
Re-evaluation (ROW)	40	53	181	57	5	336
Re-evaluation (Riparian Restoration)	19	9	54	53	6	141
Phase 1 Improvements Totals	**59**	**62**	**235**	**110**	**11**	**477**

The activities of 5 different farmers would be affected by the Phase 1 Improvements as compared to the six that were identified in the 2006 FEIS. In addition, the Washington Lettuce and Vegetable Company has since sold to a developer that is actively marketing the property for commercial development. Because most of the affected agriculture use property is located within the area of the project that will be impacted during Stage 2 of the construction timeline, the current agricultural leases will be allowed to continue until approximately the 2024 timeframe, depending on project scheduling.

The 2006 FEIS also identified potential effects to farmlands near the Valley Avenue interchange and noted that farmland parcels would be bisected resulting in problems associated with equipment access and size of the leftover parcels making farming on one or both sections impractical or uneconomical. Since that time, WSDOT has acquired the parcels that would be bisected and many of the other parcels in agricultural use in this area have already been converted to large scale industrial warehousing. Urban land use changes have occurred consistent with zoning and comprehensive plans.

Table 3. Agricultural Parcels Adjacent to Phase 1 Improvements Alignment

MAP ID on Figures 1 and 2	Tax Parcel ID	Current Property Owner	Agricultural Use Identification (Visual/WSDOT Agricultural Lease)	Size of Parcel (acres)
1	420063000	Robert Mattich	Aerial photo interpretation	1.15
2	420053005+	WSDOT	Lease Information	53.3
3	420082069+	WSDOT, New Sound Transportation LLC, Benaroya Capital Company	Lease Information/Aerial photo interpretation	47
4	420083005	WSDOT	Lease Information	15.9
5	420172008	WSDOT	Lease Information	16
6	420171702	WSDOT	Aerial photo interpretation	4.86
7	420174010	Anita Mastin	Aerial photo interpretation	6.7
8	420174039	Leanna Stidham	Aerial photo interpretation	5.98
9	420174002	WSDOT	Aerial photo interpretation	4.96
10	420174023	Sharon Boitano	Aerial photo interpretation	1.1
11	420174081	WSDOT	Aerial photo interpretation	6.24
12	420178009	Peter Tovoli	Aerial photo interpretation	9.71
13	420212068	WSDOT	Aerial photo interpretation	47.1
14	420212702	WSDOT	Aerial photo interpretation	15.3

Further, as described in Section 3, there are currently no “farmlands” as defined under the FPPA within the SR 167 Project area. The lands currently in agricultural use are committed to urban development, and much of the land has already been purchased for SR 167 Project ROW. Therefore, a Farmland Conversion Impact Rating form (NRCS-CPA-106) was not completed.

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

The 2006 FEIS identified operational mitigation measures to allow circulation options for movement of farm equipment and access to fragmented acreage due to bisecting of the proposed alignment. Under the Phase 1 Improvements no land used for agricultural uses would be bisected by the project. All WSDOT owned land currently leased for agricultural use would cease operation once construction of the project begins and additional parcels along the Phase 1 Improvements alignment used for agricultural purposes would be acquired. Therefore, no operational mitigation measures would be required.

Prior to construction or operation of the proposed Phase 1 Improvements, those farms on private property that will be displaced as a result of WSDOT’s property acquisitions will be eligible for relocation assistance. WSDOT’s Real Estate Services Office implements the Relocation Assistance Program, pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act. WSDOT provides relocation assistance to persons displaced from residences, business, farms or non-profit

organizations by public works projects. Displaced farms are eligible for advisory services and monetary payments for moving and re-establishment costs.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The 2006 FEIS identified temporary impacts of the Build Alternative on existing farmland as potentially including increased noise, dust, traffic detours, and traffic congestion. Other impacts identified as a result of construction were disruption of access to parcels being farmed and traffic delays. Because all WSDOT owned land currently leased for agricultural use would cease operation once construction of the project begins and additional parcels along the Phase 1 Improvements alignment used for agricultural purposes would be acquired, no temporary construction impacts to farmlands are anticipated. Construction in the immediate vicinity of other farmlands would produce increased noise, dust and/or air pollution, but is anticipated to have negligible effect on agricultural activities.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

Mitigation measures during construction for the proposed Phase 1 Improvements will be consistent with the mitigation identified in the 2006 FEIS. As provided in Section 3.12.6 of the 2006 FEIS, consultation and coordination with affected farmers will be conducted to ensure that disruptions to farming are minimized, and adequate advanced notice of potential disruptions is given.

As described in Section 4, WSDOT has acquired the parcels near the Valley Avenue interchange area. These parcels will be converted to transportation use prior to start of construction, hence the need for coordination with individual farmers to develop circulation options for movement of farm equipment and to provide access to fragmented acreage in that area will be reduced. However, consistent with the 2006 FEIS mitigation, FHWA and WSDOT will attempt to provide access to local farmers from local streets by way of access roads and/or easements.

The 2006 FEIS described a private developer proposal to build a crossing over the SR 167 mainline east of the Puyallup Recreation Center to connect Valley Avenue to North Levee Road, and the crossing would accommodate tractors used in the fields. That crossing is no longer proposed, and is not part of WSDOT's Phase 1 design. As design progresses, WSDOT will determine if any alternative mitigation is necessary should farming continue on either side of the new highway during construction.

8. Conclusion

No new or significant impacts to farmlands from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. Rapid land development and urbanization has occurred since 2006, and parcels previously in agricultural use continue to be converted to commercial or industrial uses consistent with Comprehensive Plans and zoning. There are no parcels in the project vicinity that meet the federal Farmland Protection Policy Act definition of "farmland." No new or revised mitigation measures are required as a result of the Phase 1 Improvements.

References

Google Earth, 2017. Map images from 2006 and 2017. Accessed September 2017.

Pierce County PublicGIS. Parcel Data. Accessed November 2017.

City of Fife, 2015. *Comprehensive Plan*. Fife, Washington.

City of Puyallup, 2015. *Comprehensive Plan*. Puyallup, Washington.

Farmland Protection and Policy Act, July 5, 1984; 7 CFR 658: U.S.C. 4202(a).

NRCS. Farmland Protection Policy Act (FPPA): Program Overview and NRCS Responsibilities. Presentation. Michael Robotham, Bob Dobos, and Emmabelle Kenyon Presentation website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/ Accessed November 2017.

Pierce County 2016. Comprehensive Plan. Pierce County, Washington.

Sterino Farms, 2017. www.sterinofarms.com

WSDOT Real Estate Services, 2017. Leasing information provided September 2017.

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Attachments

Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements



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Pedestrian and Bicyclist Facilities, and Transportation Resources

COPY TO:	**Project File**
PREPARED BY:	**Chris Wellander, Transportation Lead, WSP USA Inc.**
DATE:	**October 12, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). Changes in the project, applicable laws or regulations, and the project study area are discussed as they relate to pedestrian and bicyclist facilities, and other transportation related resources including transit, Park and Ride lots, transportation demand management, commute trip reduction/ride-sharing, and coordinated transit, human services and special needs.

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1, Comparison of Design Components, for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. This NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. SeeTable 1, Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Improvements Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Specific to pedestrian and bicyclist improvements, the Phase 1 project includes the following differences from the 2006 FEIS Build Alternative:

- Reconstruction of the Interurban Trail in an alignment easterly from its current location following the proposed SR 167 mainline alignment down to the new trailhead parking.
- Inclusion of a shared-use path on the east side of the proposed new 70th Avenue E structure over I-5 that will provide a vital connection for active transportation modes.
- Construction of a new shared-use path between SR 99 and 8th Street E. along the mainline alignment of the proposed SR 509 Spur. Combined with the 70th Avenue connection cited above, this shared-use path will connect bicyclists and pedestrians between the east side of I-5 and the existing city of Fife Hylebos/Milgard Nature Area trail system, which provides an active transportation connection between 8th Street E and 4th Street E. The City of Fife is planning to identify or provide a bicyclist connection along 4th Street E between the north end of the Hylebos/Milgard Nature trail system and 54th Avenue East. WSDOT and the City of Tacoma are discussing the potential for establishing a connection between 4th Street E at 54th Avenue E to SR 509.

- Provision of a shared-use path trail along the existing SR 509 frontage road between 4th Street E and Alexander Avenue. These improvements are shown graphically in Figure 1.



Figure 1. Proposed Active Transportation Improvements

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

82 **Table 1. Comparison of Design Components**

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right-hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

83 GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban
84 interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

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3. What has changed in the affected environment since 2006?

The affected environment relative to pedestrian and bicyclist facilities and additional transportation related resources was described in Section 3.15.2 and Section 3.14.2 of the 2006 FEIS, and remains generally applicable to the proposed Phase 1 improvements. Some topics, such as coordinated transit and human services were not described in the 2006 FEIS, but are included in this 2018 analysis to fulfill NEPA Re-evaluation requirements.

Pedestrian and Bicyclist Facilities

The *Pedestrian and Bicyclist Facilities Discipline Report* (WSDOT 2004) documented the inventory conducted of each jurisdiction in the SR 167 project area for existing and proposed pedestrian and bicyclist facilities to support the 2006 FEIS. Since then, WSDOT has altered the categorization and description of bicyclist facilities, which can be seen in Table 2. These new designations will be used to describe the changes in this section in regard to existing and currently planned bicyclist facilities.

Table 2. WSDOT Roadway Bicyclist Facility Types Ordered from Most to Least Protected

Shared-Use Paths	A facility physically separated from motorized vehicular traffic within the highway right of way or on an exclusive right of way with minimal crossflow by motor vehicles. Shared-use paths are primarily used by bicyclists and pedestrians, including joggers, skaters, and pedestrians with disabilities, including those who use nonmotorized or motorized wheeled mobility devices. With appropriate design considerations, equestrians may also be accommodated by a shared-use path facility. (M22-01.09 1515.03)
Raised and Curb-Separated Facilities	These facilities are considered protected because they are vertically separated from motor vehicle traffic. The raised and curb-separated facility is dedicated for bike users and delineated with pavement markings, signing, and in some cases pavement material. (M22-01.12 1520.02(1))
Separated Buffered Bike Lanes	Separated buffered bike lanes are at grade with the roadway, and they include a bike lane, a buffer area, and some type of vertical feature that reduces the likelihood of encroachment into the bike lane by motor vehicles and increases user comfort. (M22-01.12 1520.02(2))
Buffered Bike Lanes	The design is effectively the same as a separated buffered bike lane (see above) without the use of vertical separators. (M22-01.12 1520.02(3))
Conventional Bike Lanes	Conventional bike lanes are at grade and adjacent to motor vehicle traffic lane and are designated by a single solid wide stripe between the motor vehicle lane and bike lane. (M22-01.12 1520.02(4))
Shared Lane Markings	Shared lanes are appropriate for lower-speed and lower-volume streets. Shared lanes employ pavement markings and signage to indicate the combined use. Shared lanes are more common in bicycle boulevards, establishing a complete network for cyclists within an urban or suburban environment. Shared lanes may be used on state highways within the ranges presented in 1520.03; however, it is more likely that shared lanes will interface with state highways through crossing situations. (M22-01.12 1520.02(5)

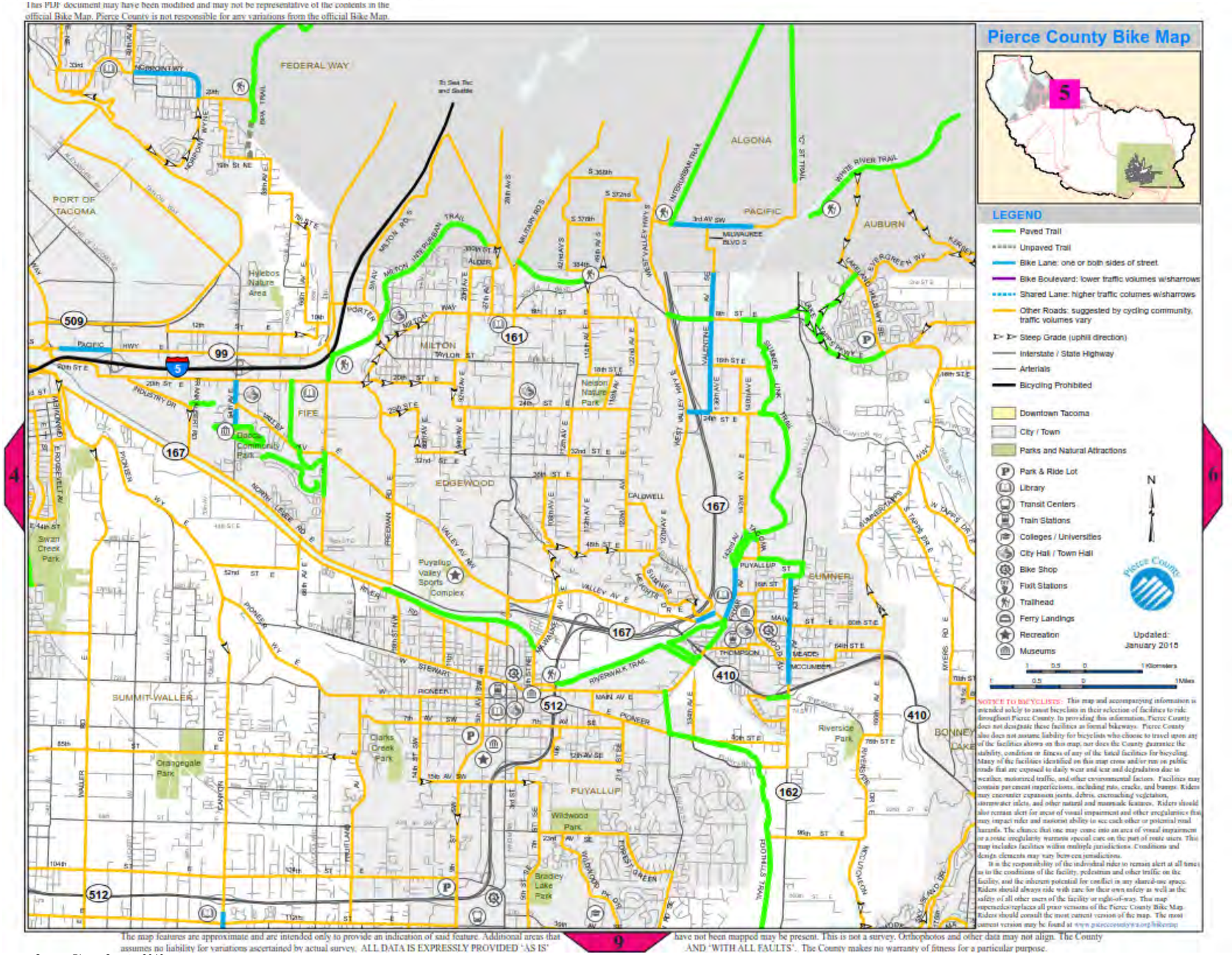
Source: Adopted from WSDOT Design Manual M22. July 2018 amendments incorporated.

Figure 2 illustrates the existing bicyclist routes within the project area as published by Pierce County in January 2018. Figure 3 illustrates some of the key existing and potential future bicyclist and pedestrian routes a person might use to get from the western portion to eastern portion of the project (SR 509 to SR 161). All new facilities will be consistent with WSDOT and/or local jurisdictional standards and will be ADA compliant. The remainder of this section provides a more detailed description of the existing pedestrian and bicyclist facilities by jurisdiction. Existing bike facilities in the area include SR 99 between Milwaukee Way and Port of Tacoma Road in Tacoma, 54th Avenue East between 20th Street and the Dacca Community Park, along with several trail facilities such as the Milton Interurban Trail and sections of 70th Avenue East and 62nd Avenue East. All of these facilities can be seen in Figure 2. Bicyclist traffic is prohibited on I-5. The other roads in the study area are "shared roadways" with various levels of bicyclist and pedestrian-accessible attributes. In many cases, these roads do not currently have adequate shoulders to accommodate bicyclists or

pedestrians separate from the vehicular travel lane. There has been an increase in bike facility mileage added by local jurisdictions and WSDOT since the 2006 FEIS.

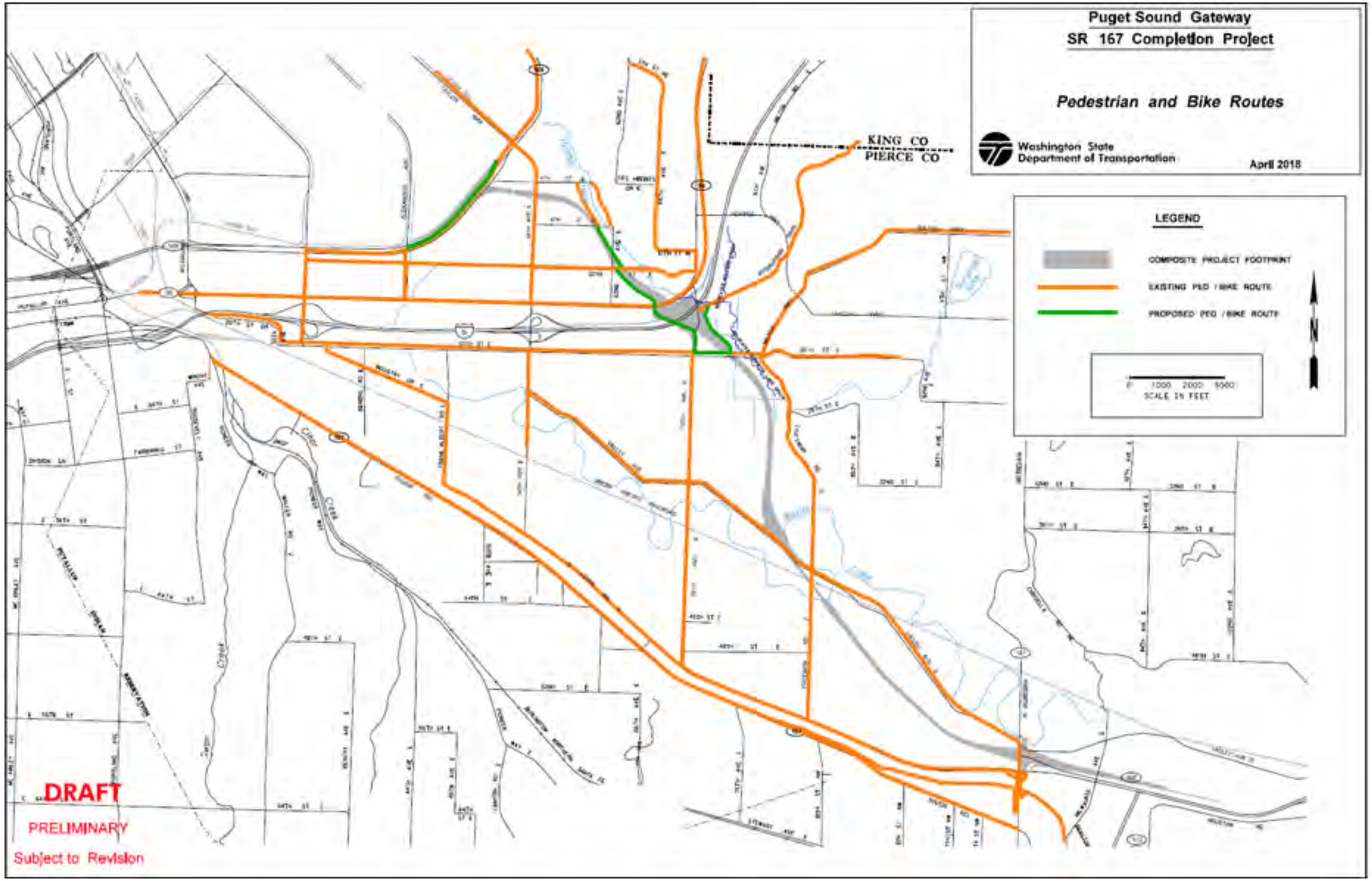
City of Tacoma and Port of Tacoma

The land adjacent to SR 509 around the proposed merging point with the new SR 509 Spur now includes auto and motorcycle dealerships, industrial supply and machinery businesses, several motels and other accommodations, warehouse/packaging, convenience stores, and vacant land. The area has multiple Commute Trip Reduction (CTR) worksites, which are required by The Commute Trip Reduction Efficiency Act to develop programs that encourages employees to find alternatives to driving alone, through a mix of elements, such as an employee transportation coordinator and transportation events. Beyond common shared roadway facilities, the existing roadway network does not have adequate accommodations for bicyclists, though it has seen an increase since the 2006 FEIS. SR 509 and 54th Avenue East both have bike lanes, as does SR 99, although the lane is not continuous, meaning that the bicyclist facility is intermittent. Many of the intersections in the area have limited pedestrian infrastructure. Although the Pierce County Bike Map (See “Other roads” (orange) in the legend of Figure 2) shows infrastructure that is “suggested by the cycling community: traffic volumes vary” as possible bike facilities, the statement made in the Tier II FEIS that “the roadway system in this area is likely to be traveled by only the more experienced bicycle riders”, is still valid. The City of Tacoma currently has undetermined and unfunded plans to complete the bicyclist facilities on SR 509 from Fawcett Avenue west of I-705 to residential areas near Browns Point north of the study area. WSDOT also plans to construct a shared-use path between Alexander Avenue East and Taylor Way, leveraging the existing infrastructure and signals at these locations. These improvements are different from what was planned at the time of the 2006 FEIS, however, it is expected to further enhance the planned bicyclist and pedestrian infrastructure in the SR 167 Completion Project, by improving connections and facilities for pedestrian and bike users, in addition to WSDOT’s planned Phase 1 Improvements.



Source: Pierce County, 2018

Figure 2. Pierce County Bike Map in Vicinity of SR 167 Completion Project



Source: PSRC, 2018

Figure 3: Pedestrian and Bike Routes

City of Fife

Land use in the City of Fife currently includes a mixture of residential, commercial, industrial manufacturing, and agricultural uses. The main residential areas are in the center of the city, north of the Puyallup River, east of Frank Albert Road East and west of 70th Avenue East. The area has seen increasing development since the 2006 FEIS and several larger parcels are still being developed for residential use within this area. These areas are expected to generate a higher level of active transportation demand as development continues to replace unimproved property sites, which further supports the benefits of completing the SR 167 project and associated pedestrian and bicyclist facility features. Based on the City's *Comprehensive Plan* (City of Fife 2005), there is one designated Urban Growth Area, located north of I-5 between the east city limit and 54th Avenue East and 62nd Avenue East, which is concurrent with the previous FEIS.

In the 2000s, increasing industrial and commercial development occurred within the City of Fife. This development resulted in roadway shoulders and sidewalks being built; however, at that time, Fife lacked the land uses and population density necessary to generate substantial volumes of bicyclist and pedestrian demand. This remains the case today, although the City continues to establish and improve its biking and pedestrian infrastructure. Most of the roadways and roadway corridors within the City have been designated as primary bikeways, or sidewalk and trail links in the City of Fife transportation plans. All roads are currently shared facilities. Sidewalks are present on larger north-south corridors and along main roads, such as 20th Street East on which the Fife High School and Public School Administration offices are located. However, many smaller residential streets do not have pedestrian infrastructure and only major intersections have pedestrian signals.

In 2012 the City of Fife published an update to its *Comprehensive Plan*, which included a discussion of current and planned bike and pedestrian facilities. The City's planned improvements are anticipated to decrease the number of miles of sidewalk gaps from 12.4 miles to 4.8 miles in the entire City, with a decrease from 6.8 miles to 2.3 miles in the pedestrian priority area. The planned improvements by the City of Fife also include the installation of nine new signalized intersections, most of which will be installed on 20th Street East (City of Fife, 2014). The 2012 *Comprehensive Plan* also includes facilities that will connect the existing bicyclist and pedestrian infrastructure in the area with a combination of bike lanes, designated shared roadways, and trail improvements. With the identified improvements, the City of Fife expects to increase its bicyclist facility mileage from 15.9 miles to between 28.2 and 44.0 miles, depending on the implemented projects.

There are multiple proposed trails within the City of Fife. The Puyallup River Trail is proposed as part of the reconstruction of the Puyallup River Levee by the Army Corps of Engineers, and was called the North Levee Trail in the 2006 FEIS. The trail project is contained in the City of Fife's active transportation plans; however, no completion date has been identified. The area of trail access improvement is located beneath the SR 167 bridge (at N Meridian Ave) and borders the Puyallup River. The proposed "Wapato Creek Nature Trail" extension is a paved shared use path that extends through the SR 167 Project right-of-way. The trail, as proposed by the City of Fife, would extend along the creek southeast through the city of Fife to the Union Pacific Rail Road (UPRR) on southern limits to Freeman Road. Part of the proposed trail would be located on Puyallup Tribe of Indians tribal property. Consistent with the situation described in the 2006 FEIS, the Puyallup Tribe is not supportive of the City of Fife's Wapato Creek Trail proposal. Additional coordination, consultation, and agreements will be required before this facility is legitimately recognized and moved forward.

The existing "Interurban Trail" extends from King County into Pierce County, through the City of Milton, ending at a new trailhead just before I-5 at 70th Avenue East. The 2006 FEIS included plans to construct the proposed Pacific National Soccer Park, located north of 20th Street East and east of 70th Avenue East, which would have required additional parking to service the facility. However, the City of Fife's proposal for the soccer park was dropped, and is no longer planned or being considered within the SR 167 Project's travel shed. The population of Fife has more than doubled from 4,784 in 2000 to an estimated 10,103 in 2016, which may further increase the expected usage of the planned pedestrian and bicyclist facilities and infrastructure beyond the estimates of the 2006 FEIS.

City of Puyallup

The study area includes only the northern section of the City of Puyallup, referred to as "North Puyallup," which is located north of the Puyallup River. The current zoning in this area is primarily limited manufacturing, interspersed with public facilities, as was described in the 2006 FEIS. However, East of Spencer Road, the zoning has since then been changed from manufacturing to general commercial and high-density, multi-family residential to accommodate the growing population. This means that there is an increasing need for varied transportation facilities, and an increasing number of people to make use of them, further incentivizing investment in active transportation travel.

The Puyallup Recreation Center, located at Valley Avenue East and 7th Street Northwest, is adjacent to the proposed SR 167 Phase 1 Improvements alignment and consists of ball fields and 25,000 square feet of indoor space with no existing plans for expansion. The automobile remains the overwhelming travel mode choice for users of the Recreation Center, although the City of Puyallup's 2015 *Comprehensive Plan* (City of Puyallup 2015) describes opportunities for improving sidewalk connectivity to and from the recreational center. Roads serving this site are designated as shared roadways with sidewalks, and the Recreation Center can also be accessed from a variety of different shared-use paths. Improvements to this area is not further considered in this technical memorandum.

In March 2016 the Active Transportation Community of Interest (ATCOI) under the Puyallup Watershed Initiative (PWI) published their report Tahoma to Tacoma Trail Network, proposing a 62-mile multi-use recreational trail between Mount Rainier, through Carbonado, Wilkeson, South Prairie and ending in Commencement Bay/Point Defiant Park . A proposed general alignment can be seen in Figure 4. While the proposed alignment is currently outside of the SR 167 Completion Project Area, the final alignment is still being explored by interested parties. There may or may not be opportunities to connect to active transportation infrastructure within the SR 167 Completion Project area pending further discussion and collaboration between the stakeholders.

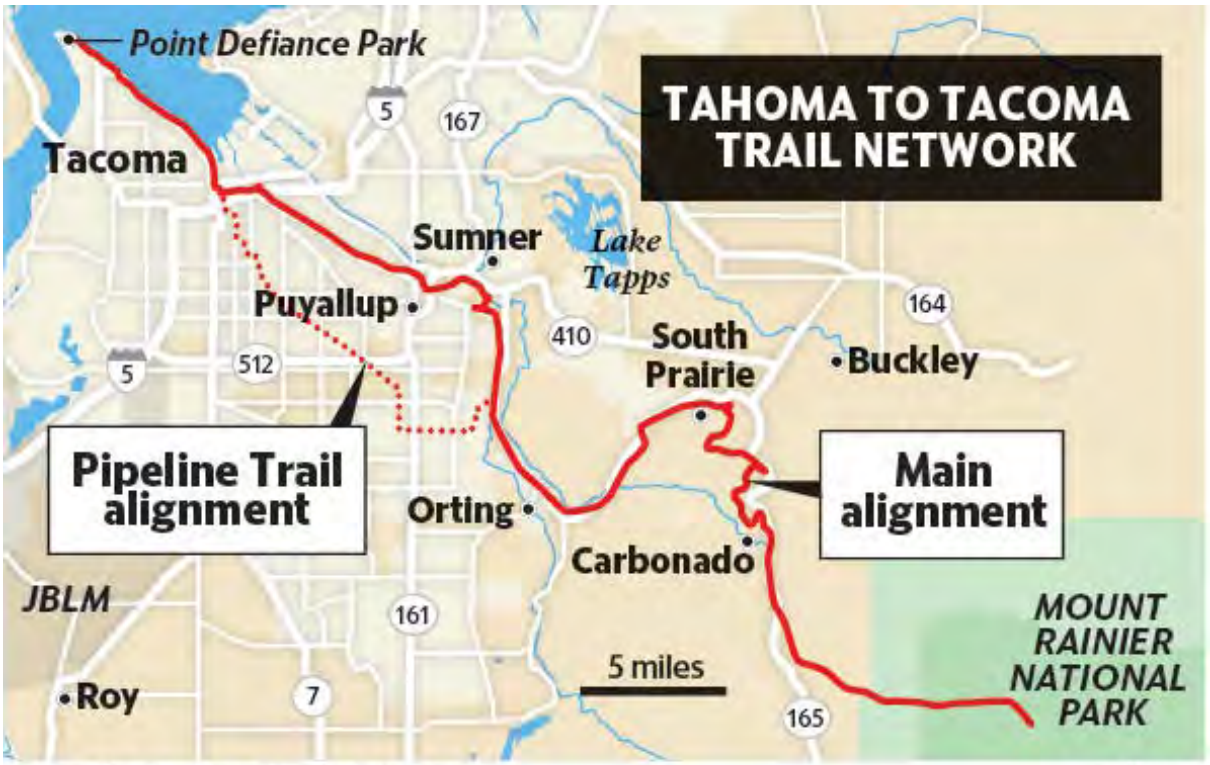


Figure 4. Tahoma to Tacoma Trail Network

City of Milton

The study area that is west and south of Porter Way extending along I-5, known as the south Milltown District, includes a portion of the City of Milton, and has seen substantial changes in zoning and land use since the 2006 FEIS. Existing land use in this area is primarily low density single-family residential, commercial, and vacant land, though residential land use has been, and continues to increase. The area is zoned commercial and light manufacturing. The City of Milton has designated several roads in the study area as Bicyclist/Pedestrian Routes, including Porter Way, 5th Avenue, and Kent Street, which is an improvement to active transportation facilities since release of the 2006 FEIS. None of the roads have paved shoulders or sidewalks, and are sloped with moderate to extreme grades. The City's West Milton Park is considered a local active transportation site destination and is served by a shared roadway and the Interurban Trail. The Interurban Trail terminates at 70th Avenue East, adjacent to I-5. The City's most recently adopted *Comprehensive Plan* (City of Milton 2015) describes improvements the City is looking to implement. These include several projects targeted at pedestrians and bicyclists, such as undetermined active transportation facilities, rectangular rapid flashing beacons in pedestrian crosswalks, several sidewalks, and an uphill bicyclist climbing lane. The improvements are planned on Porter Way, 5th Avenue, 20th Street East, Fife Way East, Kent Street, and on the Interurban Trail along with several other locations outside of the SR 167 Phase 1 Improvements study area. As discussed in a previous section, the affected cities' commitment to provide connections to the planned SR 167 Project facilities furthers the positive impacts these investments will have.

City of Edgewood

The City of Edgewood has a variety of roads "suggested for cycling" according to the Pierce County Bike Map, as previously discussed. It furthermore has a section of the 'Interurban Trail', which is currently not connected to other parts of the 'Interurban Trail', though the City hopes to connect

these in the future. There is an existing pedestrian and bike route along Meridian Avenue E between the north city limits and 24th Street East. Active Transportation facilities were recently improved as part of the Meridian Avenue E widening project. Future plans include extending these south to 36th Street East.

Pierce County

A small portion of unincorporated Pierce County lies within the study area adjacent to the cities of Fife and Tacoma, east of 54th Avenue East and south of the King/Pierce county border There is also a small unincorporated area of Pierce County bounded by Valley Ave E to the north, N Levee Rd E to the south, 82nd Ave E to the west, and 86th Ave E on the east. This area does not have any dedicated active transportation facilities.

These areas remain unincorporated, and no changes to the area have occurred compared to conditions documented in the 2006 FEIS. Overall, no substantial changes or developments have been identified, which would impact pedestrian or bicyclist facilities differently or to a greater degree, as compared to the 2006 FEIS. The infrastructure and facilities improvements that have been implemented since the 2006 FEIS are concurrent with the overarching goals of active transportation improvements of the most recent comprehensive plans. The content of the 2006 FEIS remains valid with state plans and strategies for improving safety and increasing mobility via pedestrian and bicyclist facilities.

Additional Transportation-related Resources

The bounds of the proposed Phase 1 Improvements are similar to those described in the 2006 FEIS, however the total size of the Phase 1 Improvements is smaller, leading to less affected environment than was originally documented. The 2006 FEIS contained information regarding bus transit, rail operations and park and ride lots, which will be compared further below. However, except for discussion in Sections 5 and 7, regarding mitigation, the 2006 FEIS did not include information on transportation demand management (TDM), transportation system management (TSM); intelligent transportation systems (ITS); coordinated transit; and human services and special needs, which is also described below.

Transit Services and Park and Ride Lots

Bus Transit

The project lies within the Pierce County Public Benefit Area (https://www.piercetransit.org/service-area-1) and the Central Puget Sound Regional Transit Authority (Sound Transit) service boundary (http://rtamaps2.soundtransit.org/st_determineaddress.html?_ga=2.127906125.1514033741.1530822256-1914321178.1523384949), as well as within Intercity Transit's service area (https://www.intercitytransit.com/bus/system-map). Pierce Transit provides bus service within the SR 167 Phase 1 Improvements area. Local routes connect Tacoma and Fife with Federal Way, Puyallup, Steilacoom, Spanaway, Ruston, Milton, and other areas. Pierce Transit and Sound Transit (ST) also operate express bus service on I-5, connecting Tacoma with Lakewood and Seattle, as well as with Olympia and the Olympic Peninsula. The Tacoma Dome Station, a 2,400-stall facility, serves as a transportation hub for local transit service and regional express service connections for ST Express bus service. The station also serves as a destination for ST commuter rail's Seattle/Tacoma connection. A Greyhound and Northwestern Trailways bus terminal with services to Seattle and Portland via I-5, as well as Spokane, Wenatchee, and Boise, Idaho are also located in the vicinity. The Tacoma Dome furthermore sees transit from Intercity Transit, serving Olympia, Tumwater, Lacey, and Yelm with routes terminating at the Tacoma Dome. The following local transit routes operate in the SR 167 Phase 1 Improvements study area:

- Route 63 between the north and south end of the Port of Tacoma, via North Frontage Drive
- Route 402 between Federal Way, Puyallup, and Graham via SR 161 and North Meridian
- Route 500 between downtown Tacoma to Federal Way via Pacific Highway East (SR 99)
- Route 501 between downtown Tacoma to Federal Way, via 20th Street East and Milton

Express bus service is provided in the I-5 corridor to SeaTac Airport and downtown Seattle, downtown Tacoma, and Olympia. The following routes pass through the study area:

- Express Route 574 between the Lakewood Transit Center, Tacoma Dome Station to SeaTac Airport via I-5
- 586 between the Tacoma Dome and the University District in Seattle
- 590 between downtown Tacoma, Tacoma Dome Station to Seattle via I-5
- 592 between DuPont, Lakewood to Seattle via I-5
- Express Route 594 between Lakewood, downtown Tacoma, Tacoma Dome Station to Seattle via I-5
- 595 between Purdy, Gig Harbor, Narrows Park-and-Ride, Tacoma Community College to Seattle via I-5

Altogether, these ST routes have more than 8,000 average weekday boardings. Though there are some changes to bus routes, as well as increases in weekday boardings, there are no substantial changes in terms of impacts on the SR 167 Completion Project's Phase 1 Improvements.

Rail Operations

Existing rail lines in the northern Pierce County provide passenger and freight service between the Seattle-Tacoma and the Portland metropolitan areas. The Amtrak Coast Starlight, Thruway and Amtrak Cascade use the Burlington Northern and Santa Fe (BNSF) Railway mainline 10 times daily for passenger service through Seattle and Tacoma, with less frequent service on the weekends. The BNSF mainline is located on the south side of the Puyallup River and is not directly affected by the SR 167 Project. This is consistent with changes to the conditions documented in the 2006 FEIS.

The UPRR mainline operates a single track through the southern portion of the SR 167 Project area. The mainline tracks are part of the UPRR Seattle-to-Tacoma mainline. Railroad yard facilities are located south of I-5, near Frank Albert Road. South of Tacoma to Portland, Oregon, UPRR trains operate on BNSF tracks. Approximately 16 trains each day use the Seattle-to-Tacoma mainline, which is the same as described in the 2006 FEIS.

ST commuter rail service, established in September 2000, operates the "Sounder Train" which runs between Lakewood and Seattle via Tacoma 26 times per day on the BNSF mainline. This service currently averages more than 15,900 passengers daily between Seattle and Tacoma, passing through the Port of Tacoma area. This is a substantial increase since release of the 2006 FEIS which described the train as operating four times a day, carrying around 3,000 passengers.

ST also operates the Tacoma Light Rail which runs between the Theater District/South 9th Street and the Tacoma Dome Station. ST's long-term plans are to connect the existing light rail network in Tacoma with the Link light rail in Seattle through Federal Way, Kent/Des Moines, and the Tukwila International Boulevard Station and ending in Ballard. This suggested expansion would be located nearby the I-5 and proposed SR 167 Phase 1 Improvements right of way, stopping in East Tacoma just before the study area, and in Fife, where additional parking would be added to the Tacoma Dome Station. The final alignment of this improvement is yet to be decided. Furthermore, ST was granted a $75 million to expand the western Tacoma link Light Rail section further west through downtown Tacoma, Hilltop District and Stadium District. This latter proposed ST work will not directly impact the study area, but further improves the current expansion and development of transit services, which will eventually be connected near the SR 167 Project study area.

Park and Ride lots

The 2006 FEIS and 2007 ROD documented the commitment to locate two park-and-ride lots within the SR 167 Project's acquired right-of-way. However, limited funding was allocated in the Connecting Washington funding package for the Puget Sound Gateway Program and WSDOT worked with local jurisdictions and other key agency stakeholders—including Pierce Transit and Sound Transit—to develop the scope of Phase 1 of the SR 167 Completion project which did not include any park-and-ride lots. Pierce Transit has stated via an email to WSDOT (February 2017) that they no longer have an interest in a park-and-ride lot near the future Valley Avenue interchange. A second site that had been selected for a park-and-ride lot near the SR 161 interchange has since developed into a car dealership. Looking forward however, a future Phase 2 of this project could include further discussions with both Sound Transit and Pierce Transit with regards to the need for park-and-ride facilities, including secure bicycle parking needs

Transportation Demand Management, System Management, and Intelligent Transportation Systems

Transportation Demand Management (TDM) includes various strategies to encourage more efficient travel patterns and behaviors (https://www.wsdot.wa.gov/Choices/TDMQnA.htm). TDM efforts provide multiple benefits, including reduced traffic congestion, road and parking facility cost savings, user financial savings, increased road safety, increased travel choice (especially for non-drivers), increased equity, reduced pollution, and energy savings. TDM does not refer to any specific strategy or program, but incorporates a variety of initiatives with the goal of better utilization of the existing infrastructure and transportation systems. One example of TDM is the use of high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes, of which the latter are present on northern sections of existing SR 167 in King County. Currently, there are no HOT lanes in Pierce County, and HOV lanes exist on I-5 in Pierce County from the King/Pierce county line south to the 54th Avenue interchange.

There are several completed and planned projects under the WSDOT I-5 SR 16 Tacoma/Pierce County HOV Program, as well as projects currently under construction. Completed projects include HOV lanes on I-5 between Alexander Avenue East and the Pierce/King County border in both directions, as well as several preparatory projects widening existing I-5 infrastructure and preparing for HOV connections. Currently under construction is a northbound HOV lane between Portland Avenue and Port of Tacoma Road, as well as bidirectional HOV lanes on I-5 between M Street and Portland Avenue. Both are anticipated to be completed in 2018. The former also includes work on the interchange and surrounding infrastructure that will support the connection of the proposed SR 167 Phase 1 Improvements to I-5. Planned projects include a southbound HOV lane from Portland Avenue and Port of Tacoma Road, for which construction will begin once the northbound HOV lane is completed by the end of 2018, and then continuing for three years with an expected completion date at the end of 2021. Several projects in the WSDOT HOV Program are not currently funded; including in the SR 167 Project study area, the SR 512 Vicinity to 15th Street Southwest Project which will improve and widen existing SR 167 and extend HOV lanes south to Puyallup along the corridor.

Ridesharing is widely used in Pierce County in the form of public transit, and as vanpools and carpools, with .81 million annual users in 2017. Some of these are organized centrally by transportation authorities and/or supported and mandated by individual workplaces, while others are organized through mobile applications or privately owned websites. Ridesharing is a way to decrease the number of the cars driving the same route at the same time, substantially increasing the efficient use of the infrastructure when used.

Pierce County plans to continue to improve TDM strategies through grant seeking; partnerships with neighboring transportation authorities, such as WSDOT, the Puget Sound Regional Council (PSRC)

and surrounding cities; programs and marketing targeting places of employment; and a focus on increasing car sharing.

Intelligent Transportation Systems (ITS) includes various technologies that support and enhance travel, primarily on state highways. It is primarily used and managed by WSDOT. Using a combination of different technologies, such as Bluetooth and Wi-Fi, ITS enables data collection on roads, which serves several different purposes including informing operation managers at the WSDOT Traffic Management Centers (TMC) of current traffic conditions and providing information to travelers. Examples of the use of ITS includes "active traffic management" (ATM), which allows for variable speed signs which display posted speed limits to be increased or decreased based on current conditions, or for lanes to be closed in the case of accidents. Another example is the use of ramp metering technologies, which controls inflow to mainline traffic from on-ramps, attempting to smooth out merging action to avoid bottlenecks and merge-related slowdowns. WSDOT operates six TMCs across the State, one of which is in Tacoma. These centers monitor traffic on camera and with the use of traffic detectors to respond to conditions. They operate reversible lanes, coordinate with the Washington State Patrol and incident response teams, and provide current traffic conditions and warnings, and other activities. Several ITS initiatives are in use in Pierce County other than the TMC, including the use of variable message signs (VMS) that inform drivers of construction activities, current travel times, and other activities that may impact traffic, such as sports games, and ramp metering to control the flow of cars on on-ramps. Pierce County also uses traffic data collectors, such as in-pavement induction loops, highway advisory radios, road/weather information systems, and traffic cameras. Currently there is no ATM in Pierce County, although areas around Joint Base Lewis McChord are being evaluated for the installation of ATM.

Commute Trip Reduction

The goals of the Washington State Commute Trip Reduction (CTR) program are to reduce traffic congestion, reduce air pollution, and reduce petroleum consumption through employer-based programs that decrease the number of commute trips made by people driving alone. CTR program results are achieved through collaboration among local jurisdictions, employers, and WSDOT. The state's nine most populated counties (including Pierce County), and the cities within those counties, are required to adopt CTR ordinances and support local employers in implementing CTR (WSDOT, 2018). Employers are required to develop a commuter program designed to achieve reductions in vehicle trips and may offer benefits such as subsidies for transit fares, flexible work schedules, and work-from-home opportunities. WSDOT could provide technical assistance to local jurisdictions and employers in the SR 167 Completion Project area to help implement the CTR program. Technical assistance includes training, support with data collection and analysis, and maintaining networks of partners and documentation on best practices. Both TDM and CTR also include support for bike commuting and pedestrian/bicyclist access to transit services that would benefit from infrastructure improvements to be made as described above.

Rideshare Information and Assistance

WSDOT has an ongoing program that provides commuters with information about using transit services and ridesharing to get to and from work. This information service also provides commuters with an easy way to find others who are interested in sharing their commute in a carpool or vanpool. In addition, ride-match services to regional events, such as the annual Western Washington Fair in Puyallup, help individuals find others who want to share a ride to the event. Rideshare information in and near the SR 167 Completion Project corridor is available at major employers, social service providers (state/county/city offices, hospitals, etc.), transit agencies, and all WSDOT offices. Commuters can also request a ride-match or receive information about carpooling/vanpooling at WSDOT's Rideshare Hotline number (1-888-814-1300), or online at http://rideshareonline.com/.

Coordinated Transit, Human Services and Special Needs

In 2005, Congress passed federal legislation requiring regions that produce a Metropolitan Transportation Plan (MTP) to include a regional "Coordinated Transit-Human Services Plan" component to serve as a strategy for improving coordination between a region's transit service providers and increasing transit availability to customers with special needs. This plan must be an element of the region's MTP. The PSRC and the separate counties have in recent years increased their focus on providing coordinated transit, replacing the focus on transit for the physically disabled only, to providing services for Persons with Special Transportation Needs, defined as:

> *… those persons, including their personal attendants, who because of physical or mental disability, income status, or age are unable to transport themselves or to purchase appropriate transportation.*

This group generally includes children, seniors, individuals with a disability, and low-income individuals. In 2014, PSRC published its *Coordinated Transit-Human Services Transportation Plan 2015-2018* (PSRC 2014), which guides and informs the Pierce County *Coordinated Transit-Human Service Transportation Plan* (Pierce County 2015b). Pierce County has, along with Kitsap County, the highest relative number of transit riders with special needs in the Puget Sound region.

Under coordinated transit, children age 5 to 17 years are considered special needs as they usually do not have any mobility options of their own outside those of their parents. Pierce County has the highest percentage of children in the PSRC area, with 18 percent of the county population 17 years of age or younger. Seniors in the Puget Sound area comprise 11 percent, with most populations located in denser areas such as Tacoma. Seniors often have a need to attend more health-related appointments than the general population, which may be difficult if adequate transportation is not available. The same is true for people with a disability who often need to attend places of employment, education, and health care; therefore, their transportation needs are considered as well. In 2016 the poverty rate in Pierce County was 12.1%. Low income or poverty often means that the family does not have access to vehicular transportation, relying on the bus system to get to their places of employment, education, child care, health care, social services, and others. 8.2% of households in the Puget Sound region do not own a car. Pierce County has the region's highest proportion of low-income residents.

The Pierce County Coordinated Transportation Coalition (PCCTC) represents human services agencies, private and nonprofit transportation providers, the Medicaid transportation broker, local public transportation agencies, and people who use transportation services. The PCCTC works to make it easier for seniors, individuals with disabilities, and people with low incomes to get to work or school, medical or social service appointments, shopping, recreation, and social activities. The PCCTC develops the local *Coordinated Transit-Human Services Transportation Plan* outlining strategies to meet the ever-increasing transportation needs throughout Pierce County. PCCTC currently provides the following services through the partners described in Table 3.

Pierce County will continue efforts to improve transit for individuals with special needs, and plans to close gaps in the transportation system and increase awareness of the needs of this group of transit users.

Table 3. Coordinated Transit Service Providers in Pierce County

Pierce Transit	Provides fixed-route bus service, shuttle demand response service, and vanpool within the public transportation benefit area. Also, is the project sponsor for the Adult Day Health Express, a partnership between Multicare Health Systems and Pierce Transit to provide coordinated transportation to program participants.
Pierce County Community Connections	Provides transportation connections for eligible riders in south and east Pierce County who live outside of the Pierce Transit service area. This service is called Beyond the Borders. This agency is also the fiscal agent for Mobility Management funds, which supports and coordinates the coalition and a travel ambassador program.
Mustard Seed Project	Provides volunteer transportation for seniors and persons with disabilities on the Key Peninsula.
Paratransit Services	Arranges for transportation to medical-related appointments for people receiving Medicaid benefits. Multiple private providers provide the trips.
Catholic Community Services	Provides volunteer transportation services for seniors and adults with disabilities.
Puget Sound Educational Services District	Provides transportation for pre-school-age children, as well as homeless children. It also sponsors a program called Road to Independence that provides training to recipients of a social service program on how to be a driver or dispatcher; trained individuals drive eligible riders to work or education opportunities.
United Way of Pierce County	Provides a one-call/one-click transportation resource center; 2-1-1.
Key Peninsula Community Council	Provides community transportation in the Key Peninsula on out-of-service school buses with a program called KP School Bus Connects.

Source: Adopted from the PCCTC Coordinated Transportation Plan

Summary

The changes to the existing environment since the 2006 FEIS are summarized as follows:

- An increasing amount of bicyclist facilities are available in the project area and in the region, as a whole.
- The Pacific National Soccer Park is no longer planned, resulting in lower parking requirements in the area.
- The Tahoma to Tacoma Trail proposed by AT COI, PWI has the possibility of connecting to the SR 167 project, further increasing the benefits for both projects.
- The Sounder Train has seen an increase in number of trains and boardings, from four trains per day with 3,000 boardings, to 26 trains per day with 16,000 boardings, since the 2006 FEIS.
- Sound Transit is planning on expanding the Tacoma Link Light Rail east, as well as eventually connecting this service to the northern Seattle Link Light Rail, providing service through the two counties.
- Coordinated Transit and the Commute Trip Reduction program continues to expand and develop, as does the number of ridesharing services and users.

4. Would the Phase 1 Improvements result in any new or significant impacts?

The impacts related to pedestrian and bicyclist facilities and transportation-related resources from the proposed Phase 1 Improvements are not substantially different from what was described in the 2006 FEIS. This section summarizes key changes described in the previous section.

Bicyclist and Pedestrian Facilities

Since publication of the 2006 FEIS, various authorities operating within the study area have been extending and improving bicyclist and pedestrian facility infrastructure. The SR 167 Completion Project's Phase 1 Improvements will provide some of the pieces of the improved active transportation network. Construction of The SR 167 Completion Project may result in temporary closures, permanent rerouting and/or re-designation of pedestrian and bicyclist facilities, but no net loss of infrastructure will occur, in accordance with WSDOT policy (WSDOT, 2008),

A change from the proposed 2006 FEIS project is the preclusion of bicyclist access to the SR 167 mainline between 20th Street E and SR 161. The 2006 FEIS states that SR 167 mainline access from 20th Street East will be available to bicyclists traveling between 20th Street East and SR 161. The intent of the SR 167 Completion Project is to provide a vital connection with an emphasis on freight connections and mobility. Due to concerns related to the general incompatibility of freight and bicycle modes, and the requirement to navigate through the Valley Avenue interchange, it has been decided not to allow bicyclists on any portion of the new SR 167 mainline Phase 1 facility. This condition can be revisited for a potential future Phase 2 facility. Bicyclists will be more safely served using the surrounding transportation infrastructure which includes an increase in the extent of bicycle routes available. The project will also provide a new active transportation connection along the new 70th Avenue bridge over I-5 connecting into the relocated Interurban trail off of 20th Street East. Additionally, and consistent with the 2006 FEIS, the project will provide a shared use connection from SR 99 and 70th Avenue E along the new SR 509 Spur alignment north to the Hylebos/Milgard Nature Area. The changes from the 2006 FEIS regarding bicyclist access to SR 167 are mitigated by the increase in active transportation facilities and infrastructure in the surrounding environment, and was not found to require additional mitigation by the project.

Additional Transportation-related Resources

Transit Services and Park and Ride Lots

Bus Transit

It was not found that the Phase 1 improvements will result in any new or significant impacts related to bus transit.

Rail Operations

It was not found that the Phase 1 improvements will result in any new or significant impacts related to rail operations.

Park and Ride Lots

The 2006 FEIS and 2007 ROD documented the commitment to locate two park and ride lots within the SR 167 Project's acquired right-of-way. During the scoping of phase 1 it was decided in consultation with local agencies and transit authorities, to not include these lots in Phase 1, due to limited funding and the preferred priorities of the stakeholders. However, this does not mean that park and rides are necessarily precluded from further consideration later. A second site that had been selected for a park-and-ride lot near the SR 161 interchange has since developed into a car dealership. A potential future Phase 2 of this project could include further discussions with both Sound Transit and Pierce Transit with regards to the need for park-and-ride facilities in the corridor

Commute Trip Reduction

It was not found that the Phase 1 improvements will result in any new or significant impacts related to commute trip reduction programs.

Travel Demand Management

Since the 2006 FEIS, substantial changes have been made to the planned system and demand management within the SR 167 Project corridor. Originally the facility was not planned as a tolled facility, but is now anticipated to have all-lane electronic toll points, pending toll authorization from the WA state Legislature. This is anticipated to reduce travel times, and improve level of service in the corridor, as well as provide contributing revenue for construction, maintenance and operation of project facilities and infrastructure.

Coordinated Transit, Human Services and Special Needs

In 2007 the PSRC adopted the 2007 Regional Coordinated Transit-Human Services Transportation Plan, which was previously not applicable and therefore was not included in the 2006 FEIS. The current assessment of the proposed SR 167 Project's Phase 1 Improvements found no negative impacts on local transportation authorities, the services they provide, or the delivery and achievement of their coordinated transit, human services and special needs goals.

Summary

By providing new or improved bicyclist and pedestrian facilities, and by reducing the amount of traffic on local arterials, the SR 167 Completion Project Phase 1 Improvements will provide improvements for active transportation use.. With respect to transit, the new roadway facilities will offer new connections for transit agencies to use, as well as improved access to future Link Light Rail in Fife via demand managed facilities. The relevant specific changes of the Phase 1 Improvements from the project proposed in the 2006 FEIS include:

- Preclusion of bicyclist use of the SR 167 mainline between 20th Street E and SR 161
- Conversion of the SR 167 Completion Project corridor to a tolled facility
- Not constructing two park and ride lots within the project area

5. How would mitigation measures during operation compare to the 2006 FEIS Build Alternative?

Consistent with the documentation in the 2006 FEIS for pedestrian and bicyclist facilities and transportation resources related impacts associated with operation, the Phase 1 Improvements would also require mitigation. These are not substantially different from what was covered in the 2006 FEIS, as limited changes have occurred since its publication. FHWA and WSDOT policies accommodate active transportation modes in the study area using best practice design. The general project mitigation measures regarding bicyclists and pedestrians, as described in the 2006 FEIS would also be implemented for the Phase 1 Improvements. These are listed in Table 4, which have been updated to reflect current policy and design guidance. The introduction of TDM with tolls, and several other CTR programs will provide substantial benefits to users and to the region which is an important improvement beyond what was described in the 2006 FEIS. It is determined that the previously identified mitigation measures will adequately address the impacts of the SR 167 Completion Project Phase 1 Improvements.

573 **Table 4. General Project Mitigation Measures**

Local roadways within the right-of-way of the SR 167 interchanges will be designed to the local jurisdiction's design standards and often will include bicyclist facilities and sidewalks for bicyclists and pedestrians.
All bicyclist and pedestrian facilities modified by the project would meet or exceed Americans with Disability Act (ADA) design standards.
SR 167 mainline shoulders will be designed to a maximum of 10 feet.
Local roadways and ramp intersections will be signalized to include pedestrian crosswalks, and activated signal systems, and bicyclist crossing improvements. At a minimum consider safety performance needs, projected bicycle volume, motor vehicle volume, traffic delay, roadway grade and the types of bicyclists using the intersection that may require more time to clear the intersection. Consider the installation of effective loop detectors or other methods of detecting a bicycle within the bike lane (in advance of the intersection) and turn lanes.
Work zone traffic control plans will consider non-motorized route continuity needs including public notification and provisions for safe detour routes wherever reasonable. Any detour route for non-motorized traffic indicated on the Traffic Control Plans will be physically reviewed. The existing surfaces within the project limits will be repaired, if necessary, to accommodate the special needs of non-motorists.
Local comprehensive plans will again be reviewed prior to completion of contract plans for construction. This effort will address non-motorized route continuity and network connectivity both at the local level and within the project, consistency with plans, and local jurisdiction coordination. Any such local plans affected by the project and determined to have been completed, progressed to design or construction phase will be evaluated and appropriate measures taken to address impacts.

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575 Specific mitigation measures identified in the 2006 FEIS are also relevant to the Phase 1
576 Improvements. These measures are listed in Table 5.

577 **Table 5. Summary of Specific Mitigation Measures**

At each segment or intersection, specific mitigations are recommended to accommodate non-motorized travel.
The SR 167 project includes riparian restoration that will impact the westerly segment of the Interurban Trail. The trail alignment will be re-established outside of the Hylebos Creek and riparian restoration zone, as part of efforts to avoid and minimize impacts to recreation resources.
Roadway shoulder improvements will be made to SR 99 at the shared use path terminus north to 70th Avenue East. Shoulder width will be widened to not less than 5 feet and sidewalks, curb and gutters will be considered to control motorized access and provide for safe pedestrian travel on this regionally recognized bike route. The south path terminus beneath the SR 167 overhead structures at SR 99 will require a crossing treatment.
FHWA and WSDOT will also work closely with the City of Fife to address impacts to the Lower Hylebos Nature Park, potentially including access and parking.

6. How would temporary construction effects compare to the 2006 FEIS Build Alternative?

The temporary construction effects described in Section 3.14.4 and Section 3.15.3 of the 2006 FEIS remain generally applicable to the Phase 1 Improvements, however on a smaller scale due to the alterations that has been made to the planned project.

Pedestrian and Bicyclist Facilities

The reconstruction of 70th Avenue E in the 2006 FEIS was expected to impact users of the Interurban Trail, as two roundabouts were to be completed. These roundabouts are no longer planned to be constructed, minimizing the duration and extent of construction impacts in the area. Similarly, the construction of the SR 509/SR 167 pedestrian and bicyclist features included with the Phase 1 Improvements will still affect users temporarily, though to a lesser extent due to the alterations made to the project. WSDOT will continue to provide reasonable accommodation for users, including detours on surrounding local streets. There are no changes in the temporary construction effects resulting from the relocation of Hylebos Creek, and it may still result in temporary closure of the Interurban Trail, during construction, depending on the final design of the relocated creek and the trail.

Transportation Resources

The 2006 FEIS did not specifically discuss any impacts to transportation-related resources discussed in this technical memorandum during construction. Some disruption may occur from temporary street closures, and detours will be made available on alternative surface streets. It is the intent of WSDOT to complete work on primary segments and nodes during night-time periods of low traffic volumes. Construction activities will, as in the 2006 FEIS, be coordinated with relevant authorities, including commuter rail and bus service authorities.

In summary, the temporary construction effects from this project will be comparable to or less than those identified in the 2006 FEIS for pedestrian and bicyclist facilities, as well as for transportation-related resources. There is no increased negative impact from temporary construction effects of the project under the proposed Phase 1 Improvements.

7. How would mitigation measures during construction compare to the 2006 FEIS Build Alternative?

The mitigation measures as described in Section 3.14.4 and Section 3.15.6 of the 2006 FEIS remain applicable to the proposed Phase 1 Improvements, and appropriate for the impacts and disruption caused by the reduced scale of the project as compared to the 2006 FEIS Build Alternative.

Pedestrian and Bicyclist Facilities

Construction of the SR 509/SR 167 features would result in temporary closures to bike lanes on SR 509. Detours would be available on the surrounding local streets. Reconstruction of 70th Avenue East likely would include a closure that would temporarily affect users of the Interurban Trail.

With the temporary closure of 70th Avenue East and the remaining routes being 54th Avenue East and Porter Way, physical reviews of the facilities and minor improvements may be necessary to accommodate active transportation travel during the 70th Avenue East detour phase.

Transportation Resources

Construction of the SR 509/SR 167 features would likely result in temporary closures, detours, or reroutes on the affected roads, including SR 509, SR 167, and the area around the I-5 and SR 509 spur/SR 167 interchange. It is likely that Pierce Transit Route 501, which serves riders between downtown Tacoma, Milton, and Federal Way, would experience long-term stop closures or relocation as construction connects the two roads around the 20th Street East area. Route 501 serving Pacific Highway East (SR 99) may experience short-term closures, reroutes, or stop relocations. Impacts on the Sound Transit buses would most likely be short term, temporary, and minor.

There would be minimal, if any, impacts to coordinated transit, human services and special needs transportation under the proposed Phase 1 Improvements. Furthermore, there would be no impact to traffic demand management during construction of the Phase 1 Improvements.

8. Conclusion

As described above, no new or significant impacts related to pedestrian and bicyclist facilities and transportation-related resources from construction and operation would occur because of the Phase 1 Improvements that were not previously identified in the 2006 FEIS. Mitigation measures would include detours, timely information, implementation of best practice travel demand management, rerouting and establishment of connections to existing bicyclist infrastructure, and improvements to travel times and level of service for both transit, roadway users, active transportation users and coordinated transit. Due to the absence of impacts from the proposed Phase 1 Improvements on the affected environment in the study area, no additional mitigating measures are needed for the SR 167 Completion Project beyond what was documented in the 2006 FEIS. WSDOT and FHWA, in coordination with other involved transportation authorities, will continue to follow best practices during both construction and operation of the proposed facilities, as well as in addressing any concerns or comments regarding the impacts of the project from the public or local jurisdictions as design progresses, and during project construction and operation.

References

Edgewood, City of, 2015. *Comprehensive Plan.*

Fife, City of, 2005. *Comprehensive Plan*. Updated 2012.

Milton, City of, 2015. *Comprehensive Plan*.

Pierce County, 2004. Pierce County Commute Trip Reduction (CTR) Program.

Pierce County, 2015a. *Pierce County Comprehensive Plan.*

Pierce County, 2015b. *Coordinated Transit-Human Service Transportation Plan.*

Pierce County, 2018. *Pierce County Bike Map.*

Puget Sound Regional Council (PSRC). 2010. *Transportation 2040.*

Puget Sound Regional Council (PSRC). 2014. *Coordinated Transit-Human Services Transportation Plan 2015-2018.*

Puget Sound Regional Council (PSRC). 1996. *Metropolitan Transportation Plan.*

Puget Sound Regional Council (PSRC). 2018. *Funding Application*

Puyallup, City of, 2015. *Comprehensive Plan*.

Washington State Department of Transportation (WSDOT), August 2004. *Pedestrian and Bicycle Facilities Discipline Report, SR 167 Extension Puyallup to Port of Tacoma Tier II DEIS.*

Washington State Department of Transportation (WSDOT), 2007. *State Highway System Plan.*

Washington State Department of Transportation (WSDOT), 2008. *Washington State Bicycle Facilities and Pedestrian Walkways Plan.*

Washington State Department of Transportation (WSDOT), 2016. *Strategic Highway Safety Plan* (Target Zero).

Washington State Department of Transportation (WSDOT), 2017a. *WSDOT Design Manual M 22-01.14*.

Washington State Department of Transportation (WSDOT), 2017b. October. *Puget Sound Gateway Program SR 167 Folio. https://www.wsdot.wa.gov/NR/rdonlyres/D333A4AE-CFF5-4B80-95C6-4919C11A2E29/122007/SR167_folio_100317_small.pdf*

Washington State Department of Transportation (WSDOT), 2018. *Commute Trip Reduction.*

Washington State Transportation Commission (WSTC), 1991. *Bicycle Policy Plan.*

Washington State Transportation Commission (WSTC), 1993. *Pedestrian Policy Plan.*

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Attachments

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Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements Vicinity Map



Washington State Department of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

March 1, 2018

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology & Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Log: 080700-51-FHWA
RE: SR 167 Extension Project, Puyallup to SR 509 – New Freeway
Cultural Resources Survey Report to Support NEPA Re-Evaluation

Dear Dr. Brooks:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the SR 167 Extension Project to address transportation needs in Pierce County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We are inviting your review of a recent cultural resources survey report prepared to ensure compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800 as the project proceeds.

FHWA approved the Tier I Environmental Impact Statement (EIS), identifying a preferred route for the highway, in 1999. WSDOT began further study of the selected corridor in spring of 1999 with the Tier II EIS. FHWA published the Tier II Final EIS, outlining plans to avoid or lessen the project's potential environmental impacts, in December 2006. FHWA approved the Tier II FEIS by signing the Record of Decision in October 2007, allowing WSDOT to continue with right-of-way acquisition, and advanced engineering as funding allowed. Design work completed since 2007 resulted in revisions to the SR 167 alignment to further reduce environmental impacts, complexity, and right-of-way and construction costs. WSDOT revised the project Area of Potential Effects (APE) accordingly, and transmitted the revised APE to the SHPO in August 2015.

Funding authorized by the 2015 “Connecting Washington” legislation was less than required to construct the full Build Alternative described in the 2006 FEIS. Therefore, in accordance with legislative proviso, WSDOT conducted a series of Steering and Executive Committee stakeholder meetings in 2016 and 2017 in order to reach consensus with stakeholders on a reduced SR 167 project scope and design features. The outcome of this stakeholder collaboration was a new proposed SR 167 “Phase 1 Improvements” which is somewhat smaller in scope than the preferred Build Alternative described in the 2006 FEIS. These

Phase 1 Improvements will complete the SR 167 freeway by building four miles of a new facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 (I-5) near the 70th Avenue crossing. The project also includes a new, two-mile highway section from SR 509 near the Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509.

The APE for the Phase 1 Improvements is the same as what was provided to the SHPO in 2015. Archaeological and Historical Services (AHS) conducted additional cultural resources survey and further evaluation of the APE in the fall of 2017, as described in the enclosed report. AHS completed field survey of 6.7 acres and excavation of a total of 36 shovel tests in portions of the Phase 1 right-of-way not accessed for survey in 2015. Unfortunately, the recent archaeological survey could not be completed on all the remaining parcels due to field conditions or lack of permissions. Cultural resource investigations will occur on these parcels prior to project construction, as stipulated in the amended Memorandum of Agreement (MOA) signed in 2013.

The 2017 investigation did not result in discovery of any previously unrecorded archaeological sites. WSDOT will continue to avoid archaeological site 45PI488, as documented in the original project MOA signed in 2006. No buildings or structures in the 2017 (6.7 acre) survey area crossed the 45-year-old threshold since the 2015 investigations, and no additional structures were recorded in 2017. Of the six extant NRHP-eligible historic properties identified in the SR 167 Project APE during previous cultural resources investigations, three remain within the proposed Phase 1 right-of-way, and WSDOT anticipates that two will be adversely affected by the project. The houses at 6020 8th Street E and 4403 Freeman Road E remain in the direct footprint of the Phase 1 alignment and will need to be removed.

A third house, at 6007 Milwaukee Avenue E, is outside the direct footprint, but WSDOT previously anticipated that the house would either need to be removed or have a noise wall constructed on the property. A recent change in the preliminary design for the Phase 1 Improvements indicates that the parcel will not need to be acquired by WSDOT, and therefore the house will not be removed or otherwise directly impacted. Proposed work in the vicinity of the house may include a noise wall and retaining wall up to 16 feet high, which would be constructed along the southern edge of the existing SR 167 right-of-way. Given the previously compromised integrity of setting and the fact that the house is eligible for its design, we have determined that these indirect effects will not be adverse. This reverses our previous determination of adverse effect made in our letter of September 28, 2016, when we believed the house would be directly affected.

We invite your review of the cultural resources report and our effect determinations. WSDOT is proposing DAHP Level II documentation as mitigation for the loss of the two eligible historic properties at 6020 8th Street E and 4403 Freeman Road E. This commitment would be memorialized in an amended project MOA. We look forward to future consultation to amend the project MOA and resolve adverse effects to these properties.

If you have questions or comments regarding the proposed project, you may contact me by phone at 360-570-6638, or by email at kiersro@wsdot.wa.gov.

Sincerely,



Roger Kiers
WSDOT Archaeologist

Enclosures: *Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project - Puyallup to SR 509, Pierce County, Washington*, prepared by AHS, December 2017 (via WISAARD)

cc: Jeff Sawyer, WSDOT Olympic Region EHS
Dave Davies, WSDOT SR 167 Completion Project
Dean Moberg, FHWA Area Engineer

CULTURAL RESOURCES REPORT COVER SHEET

Author: Christopher Yamamoto, Stephen Emerson, and Rebecca Stevens

Title of Report: Cultural Resources Investigations for the Washington State Department of Transportation's SR 167 Tacoma to Puyallup New Freeway, Pierce County, Washington

Date of Report: December 2015

County(ies): Pierce Section: 1, 2 Township: 20N Range: 3E
Section: 5-8,16,17,20-22 Township: 20N Range: 4E

Quads: Tacoma N, Tacoma S, Poverty Bay, Pyuallup Acres: 240

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☒ Yes ☐ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:
45PI488

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project–Puyallup to SR 509, Pierce County, Washington

By: Christopher Yamamoto, Stephen Emerson, and Rebecca Stevens

Principal Investigator: Stan Gough

Submitted to Washington State Department of Transportation
Agreement GCB-1426, Task Order AK

Short Report DOT15-04
Archaeological and Historical Services
Eastern Washington University

December 2015

Executive Summary

Washington State Department of Transportation (WSDOT) plans to build a new State Route (SR) 167 connection between Tacoma and Puyallup as part of the SR 167 Extension Project—Puyallup to SR 509 new freeway. The proposed new segment of SR 167 will build the remaining four miles of SR 167, completing the long-planned connection to (Interstate 5) I-5. The project also includes a new two mile connection from I-5 to SR 509. The new highway will provide two general purpose lanes in each direction and an HOV lane in each direction from I-5 to Puyallup. The project will build five interchanges located at SR 509, 54th Avenue, I-5, Valley Avenue East, and SR 161 (Meridian). The project is designed to improve regional transportation system mobility between the existing SR 167 terminus in Puyallup, through the Puyallup River valley connecting to I-5 near the 70th Avenue overcrossing and continuing westward to connect with SR 509 near the Port of Tacoma. Planned improvement will serve multimodal local and port freight movement and passenger movement, while balancing environmental needs.

Environmental documentation for the project was completed in November 2006 with release of the Tier II Final Environmental Impact Statement (FEIS). The FHWA signed the Record of Decision (ROD) in October 2007. The purpose of this Cultural Resources Investigation is, in part, to support WSDOT's NEPA Re-Evaluation, comparing impacts documented in the original Tier II FEIS alignment with impacts resulting from WSDOT's new proposed "Refined Alignment" (RA) developed in 2008, considering current conditions.

The original alignment documented in the 2006 FEIS was investigated previously through archaeological survey, built environment survey, and limited archaeological testing in 2000-2004 (Luttrell 2001, revised 2005). The cultural resources investigations for this project will assist the Federal Highway Administration and WSDOT in compliance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. Archaeological and Historical Services (AHS), Eastern Washington University, personnel conducted cultural resources investigations for those portions of the project APE along the RA right-of-way (ROW), as mapped by WSDOT, that were not part of the 2000-2004 investigation of the original FEIS alignment.

Cultural resource investigations for the current phase of SR 167 Extension Project—Puyallup to SR 509 fieldwork did not result in the discovery of any previously unrecorded archaeological sites. Shovel testing in the site 45PI488 vicinity resulted in recovery of two small fire-modified rock (FMR) fragments resulting in shifting the site boundary approximately 10 meters north to include the locations where the FMR was identified.

Sixty-five properties over 45 years of age were recorded during the built environment survey of the project APE conducted to identify and record buildings/structures not addressed during the original FEIS phase, or that have reached the 45 year threshold in the interim. Applying criteria developed by the National Park Service, and presented in National Register Bulletin 16A, it was determined that six properties of the 65 properties recorded are eligible for listing in the NRHP, based upon the integrity of their architecture, historic appearance, and original construction materials.

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Introduction

Washington State Department of Transportation (WSDOT) plans to build a new State Route (SR) 167 connection between Tacoma and Puyallup as part of the SR 167 Extension Project—Tacoma to SR 509 new freeway. The project is located in Pierce County, Washington, between SR 509 and SR 167 (Figure 1). The project encompasses parcels in Township 20 North, Range 3 East, Section 1, and multiple sections in Township 20 North, Range 4 East and extends for a distance of approximately six miles.

The proposed new segment of SR 167 will build the remaining four miles of SR 167 completing the long planned connection to Interstate 5 (I-5). The project also includes a new two mile long connection from SR 509 to I-5. The new highway will provide two general purpose lanes in each direction and an HOV lane in each direction from I-5 to Puyallup. The project will build five interchanges located at SR 509, 54th Avenue, I-5, Valley Avenue, and SR 167 (Meridian). The project is designed to improve regional transportation system mobility between the existing SR 167 terminus in Puyallup, through the Puyallup River valley connecting to I-5 near the 70th Avenue overcrossing and continuing westward to connect with SR 509 near the Port of Tacoma. Planned improvement will serve multimodal local and port freight movement and passenger movement, while balancing environmental needs. Overall, the proposed project is planned to reduce congestion and improve safety on arterials and intersections by providing improved system continuity between the SR 167 corridor, I-5, and SR 509 and maintaining or improving air quality in the corridor to ensure compliance with the current State Implementation Plan and requirements of the Clean Air Act.

Environmental documentation for the project was completed in November 2006 with WSDOT's and the Federal Highway Administration's (FHWA) release of the Tier II Final Environmental Impact Statement (FEIS). The FHWA signed the Record of Decision (ROD) in October 2007. In early 2008 WSDOT Olympic Region Project Development endorsed a "Refined Alignment" (RA) of the project, undertaken to further reduce environmental impacts, complexity, right of way acquisition, construction costs, and project risks. The project was essentially shelved at that time due to lack of funding. In early 2015 WSDOT began a NEPA Re-Evaluation to assess whether the RA would result in new significant environmental impacts not previously addressed. The Re-Evaluation is also required given more than three years had elapsed since the Tier II FEIS was issued, and to address regulatory and other changes, e.g., land use and development which has occurred along the corridor since 2006. The RA is WSDOT's current proposed "preferred alternative" for the project.

The purpose of this cultural resources investigation, along with other disciplines being reviewed and updated in support of the NEPA Re-Evaluation, is to compare impacts documented in the original Tier II FEIS alignment with the proposed RA developed in 2008. The NEPA Re-Evaluation process will determine if the existing environmental documentation from 2006 is still valid. If new or previously unknown significant environmental impacts would result from the new RA, a Supplemental FEIS (SFEIS) would be triggered.

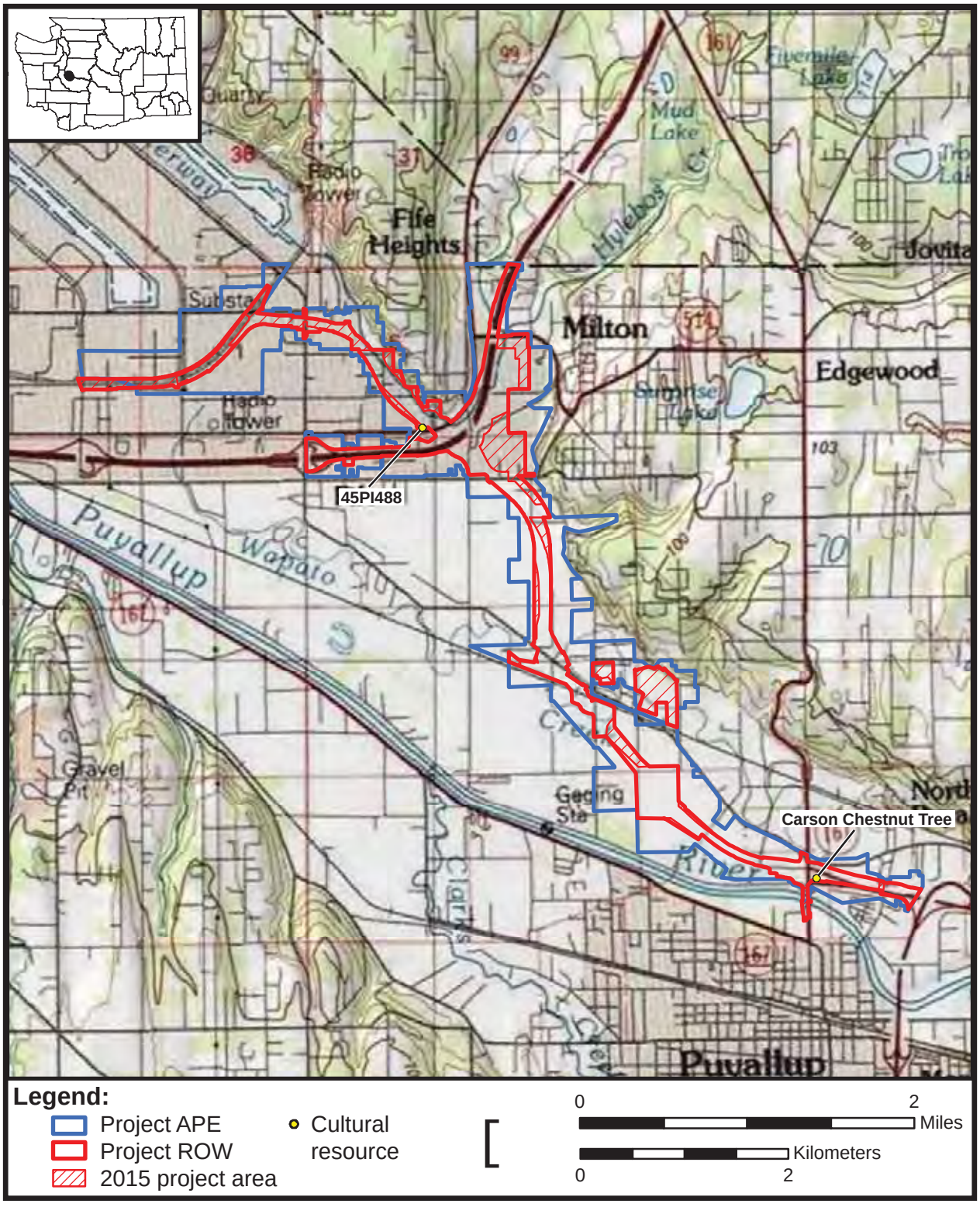


Figure 1. *Map showing the SR 167 Extension Project APE and previously recorded cultural resources mentioned in the text (adapted from USGS 7.5' topographic quadrangles Tacoma North, Poverty Bay, and Puallup, Wash).*

The project area of potential effects (APE) includes areas where archaeological resources may be encountered or disturbed and areas where historic structures, landscapes, and viewsheds may be directly or indirectly affected. Potential effects to archaeological sites are primarily anticipated where ground disturbance will occur during project construction. Historic structures may be directly affected by the above described construction activities, and may be indirectly affected by noise, vibration, or changes to the visual environment associated with the construction and implemented use of the proposed project. The original alignment for the project as documented in the FEIS was investigated through archaeological survey, built environment survey, and limited archaeological testing in 2000-2004 (Luttrell 2001, revised 2005). The cultural resources investigations for this project will assist the FHWA and WSDOT in compliance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act.

Archaeological and Historical Services (AHS), Eastern Washington University, personnel conducted cultural resources investigations for those portions of the project APE along the RA, as mapped by WSDOT, that were not part of the 2000-2004 FEIS alignment. In this report those areas of the RA surveyed and reported on in this report are collectively referred to as the "2015 project area." In addition, shovel tests were excavated to refine the boundary of buried prehistoric site 45PI488 discovered during previous investigations (Luttrell 2001, revised 2005).

Previous cultural resources investigations for the SR 167 Project involved multiple episodes of fieldwork and archival research between 2000 and 2004. The following background report sections are from Luttrell (2001, revised 2005). Information from the earlier report has been updated where appropriate. Results of the 2015 fieldwork and recommendations sections follow the background sections. Appendix A is a set of US Geological Survey Quadrangle maps showing the project APE location. Appendix B presents detailed aerial project APE maps showing the RA areas surveyed and shovel tested in 2015. Appendix C contains Washington State Inventory forms completed as a result of the current project investigations. Appendix D presents shovel test data.

Environmental Setting

Geology

The project APE is adjacent to Puget Sound, in the geographical area known as the Puget Lowland within the lower Puyallup River valley. Major streams crossing or adjacent to the project APE are the Puyallup River, Hylebos Creek, and Wapato Creek. During the late Pleistocene, the Puget lobe of the Cordilleran ice sheet covered the Puget Lowland. The most recent episode of extensive ice cover was during the Vashon Stade of late Pleistocene Fraser Glaciation (Thorson 1980:303).

The Puyallup Valley is a relict subglacial meltwater channel cut in advance outwash deposits during recession of the Puget lobe, ca. 14,000 before present (B.P.); "subsequent marine, deltaic, and alluvial deposits partly filled the meltwater troughs before this topography" was later inundated by the Osceola Mudflow approximately 5700 B.P. (Dragovich et al. 1994:3). The

Dragovich et al. (1994) investigations provide important information for understanding lower Puyallup River valley Holocene sedimentation.

Prior to Osceola Mudflow deposition, the lower Puyallup River valley was a marine embayment with the Puyallup River mouth and resulting delta located a short distance down valley from the present city of Puyallup (see Dragovich et al. 1994). Glacial and postglacial sediments underlying the Osceola Mudflow in the valley between the City of Puyallup and the present Puyallup River's mouth at Commencement Bay consist of glacial drift and outwash, in turn overlain by undifferentiated deltaic deposits consisting of gravels, sands, silts, clays, and peat, as well as prodelta sands, gravels, and cobbles (Dragovich et al. 1994:Figure 8).

The massive Osceola lahar or mudflow swept down the slopes of Mount Rainier, blanketing "the drift valleys and plain with as much as 100 ft (31 m) of clay-rich gravel, cobbles, and boulders (or diamicton). Its average thickness is about 25 ft (8 m)" (Dragovich et al. 1994:3). This volcanically-induced landslide mass moved down the mountain incorporating rock debris, glacial ice, and stream water, its fluidity allowing it to blanket much of the Puget Lowland (Dragovich et al. 1994:3). Since that time, the Puyallup River valley has remained a depositional environment as the valley infilled through a combination of fluvial, deltaic, and laharic processes.

The Osceola Mudflow in the valley near Puyallup is overlain by less than 30 meters (100 feet) of deltaic gravels, sands, silts, clays and peat, as well as gravel- to clay-sized alluvium. In the central lower valley near the city of Fife, these same sediments are ca. 90 meters (295 feet) thick (Dragovich et al. 1994). Between Puyallup and Fife within the SR 167 project APE, gravel to clay alluvium overlying deltaic sediments is only about 6 meters (20 feet) thick. This alluvium includes more recent volcanic mudflow (lahar) sediments (Dragovich et al. 1994:24).

Climate, Soils, and Vegetation

Pierce County has a marine west coast climate. Summers are generally cool and dry, while winters are moist and comparatively mild. The Cascade Range to the east protects the area from continental air masses that intensify the cold winters and hot summers characteristic of central Washington. Fall (September through November) and winter (December through February) are the wettest seasons (Anderson et al. 1955:6). During summer, irrigation is commonly used for truck crops and pastures on resident alluvial soils. The climate is generally considered moderate and the average frost-free season is 190 days (Zulauf 1979:4).

Project APE soils are of the Puyallup-Sultan association. This soils group includes the nearly level floodplains in the vicinity of Puyallup and Fife. These soils formed in alluvium and tend to be well drained or moderately well drained. The Puyallup-Sultan association consists of 17 percent Puyallup soils; 17 percent Sultan soils; 12 percent Orting soils; 12 percent Pilchuck soils; and smaller amounts of lesser constituents, including Semiahmoo Muck. Higher percentages of Pilchuck soils are found in proximity to the Puyallup River. Soil pH ranges from the mildly acidic to very slightly basic (6.1 to 7.3) Sultan fine silt to the acidic to very slightly basic (5.6 to 7.3) Pilchuck fine sand (Zulauf 1979:Table 11).

Farm, residential, and industrial uses dominate the Puyallup-Sultan soil association and, consequently, vegetation patterns are greatly altered from those of the pre-settlement period. Formerly, the project APE vicinity was thickly vegetated with a mixed coniferous and deciduous overstory and an understory of young trees, shrubs, and vines. The project APE lies within the Puget Sound area of the *Tsuga heterophylla*, or western hemlock, vegetation zone (Franklin and Dyrness 1973:44) but, except along waterways, natural vegetation has been replaced by cultivated truck gardens, pastures, and urban development. Cultivated crops such as lettuce, celery, cabbage, pumpkins, corn, berries, bulbs, and flowers are some of the more important local farm products. Those and ornamental species in urban areas comprise the general vegetation pattern present in the project area.

Cultural Setting

Prehistory

The SR 167 project APE is situated in the Southern Puget Sound Resource Protection Planning Process Study Unit, a geographic area containing prehistoric cultural resources in King, Kitsap, Pierce, and Thurston counties, as well as those along the saltwater shoreline of Mason County, Washington. As a management tool, the study unit provides a framework for establishing National Register of Historic Places (NRHP) significance for prehistoric resources (Wesson and Stilson 1987:24). Within the Southern Puget Sound Study Unit, a prehistoric human presence is best documented for the period of ca. 11,000 to 250 years B.P.

That period of human history can be divided into the following chronological cultural sequence: Paleo-Indian (12,000-8000 B.P.), the Early Period (8000-5000 B.P.), the Middle Period (5000-1000 B.P.), and the Late Period (1000-250 B.P.). Numerous cultural changes occurred over this time period, including distinct variations in stone tool forms and technologies. Dating between 10,000 and 9000 B.P., four different technological complexes are represented in the Puget Sound region, the Fluted Point, the Stemmed Point, the Pebble Tool, and the Microblade traditions (Carlson 1990:60). These traditions are known from surface finds and from well-dated archaeological contexts.

Human colonization of Puget Sound began after glacial ice recession and the presence of the various tool-making traditions is presumed to represent incoming populations with at least two environmental adaptations, one based on marine resources and another more focused on terrestrial hunting. Over time, these developed into the unique cultural expression known as Northwest Coast. Information concerning the individual groups and bands that most recently occupied the Northwest Coast culture area is well documented from ethnographic accounts and the oral traditions of resident Native American peoples.

Ethnographic Period

The Puyallup River drainage basin is within a large area assigned to cultural groups who spoke the Southern Lushootseed tongue of the Salish language family. Collectively, speakers of Southern Lushootseed, Northern Lushootseed, and Twana are presently referred to as the Southern Coast Salish (Suttles and Lane 1990:485). Within that broader designation, the Southern Lushootseed-speaking Puyallup are directly associated with the Puyallup River area. Neighboring groups included the closely related Nisqually, as well as the Skokomish and the various peoples collectively known as the Muckleshoot Indians.

All aboriginal groups in the Southern Puget Sound adhered to a winter village pattern wherein sedentary populations coalesced at specific sites during winter months. Ethnographic information obtained by Marion Smith (1940:9) indicates that typical Puyallup villages were not built along the edge of Puget Sound, but along creeks and rivers, and "above the tide flats" where these streams flowed into the Sound in their traditional territory. Such villages were permanent headquarters of individual village groups and a specific village site and its associated waterway shared the same name (Smith 1940:7). One, or perhaps two, large communal houses (each containing four to six families) commonly comprised a given village (Smith 1941:203, 1963:5). A village's population was normally greatest during the winter season.

> The village site was determined by strictly topographical considerations. In every case it was located either at the juncture of two streams or at the mouth of the stream where it entered the [Puget] Sound. The houses themselves were constructed upon bits of high, well-drained ground. The village frequently consisted of only one house, large enough for four or six families, and never more than three such houses. Additional houses built upstream but a mile or so apart may very well have been considered part of the village, but whether this condition existed prior to the occupation of the land by the whites is doubtful. In any case, the houses were oriented to the smaller streams, each of which had its own annual salmon run, and not to the streams or salt water inlets into which these emptied [Smith 1940:5].
>
> The houses were built solidly of split cedar planks, the ridge-pole of the rather high gable roofs following the length of the building. Doorways were placed at each end on a line with the roof peak and, as every house paralleled the bank of the stream above its outlet, one door faced up-stream toward a narrowing vista of water and clear bank and the other faced the wider expanse where two waters met. These really served as back door and front door [Smith 1963:5].

Smith (1940:8-10) identifies a number of Puyallup-Nisqually villages, including four potentially located in or near the project area:

> 4. kalkalaqu
> At the mouth of Wappato [Wapato] Creek, just above the grasslands.
>
> 5. shaxlabc
> Located on Hylebos Waterway. Derived from haxl', the name of Hylebos Waterway, in which silver salmon were plentiful.
>
> 6. tsaqwe′qwabc

> Located where Clarks Creek emptied into the Puyallup River. Derived from saqwéqu, the name of Clarks Creek. In addition to contacts up and down the Puyallup River this village had strong connections with that of Clover Creek (19).
>
> 7. sq'wa'dabc
> Located above the Wappato Creek village, where a creek entered Wappato Creek. Derived from qʿwad, the name of the creek, Simmons Creek (?).

Waterways not only defined territorial and group affiliations, they also served as the most important transportation routes. Keeping in mind that during aboriginal times the Puyallup River Valley "was covered by a dense forest with almost impenetrable undergrowth," it is easy to see how drainage systems formed the only "continuous lanes of communication":

> Canoe travel naturally followed water courses but, more than that, trails likewise could best be maintained on beaches and along the shores of streams where the annual floods swept a clear path. It was almost physically impossible to cut directly across country [Smith 1940:2].

Some of Smith's (1940) information was drawn from ca. 1920 native informant interviews by Thomas T. Waterman. Of the many place names Waterman recorded in Puyallup territory, three are located in the central part of the project area: the flats between Hylebos Creek and Wapato Creek whose aboriginal name means "place around which the water flows"; a place where Wapato Creek approaches a swamp extending to Hylebos Creek, meaning "plowing through with a canoe," due to the fact that a canoe could be shoved from the creek into the swamp to hunt beaver; and, Simon's Creek flowing from Surprise Lake to Wapato Creek the name of which means "waterfall" (Waterman 1920:124).

Other than the permanent village headquarters, the Puyallup also lived at temporary camps during their annual subsistence round. Food gathering was somewhat divided by gender, with women gathering vegetable products and men hunting and fishing, but no true separation of work existed in everyday practice (Smith 1940:138). The Puyallup and their Southern Coast Salish neighbors had a greater dependence on vegetable foods and land game than did other Puget Sound groups. A wide variety of sprouts, roots, bulbs, berries, and nuts were consumed, while blacktail deer and elk were the most important game animals (Suttles and Lane 1990:489).

Camas, bracken, and wapato are identified as important root or bulb crops. Acorns were collected from prairies in the nearby Nisqually area (Curtis 1913:58; Suttles and Lane 1990:489). Numerous species of berries were harvested, as were the many waterfowl and shellfish. Meals included fresh and/or preserved commodities. Of all subsistence resources, "salmon was the most important single food" (Smith 1940:235). Salmon were eaten fresh, as well as cured by a variety of methods. Smith (1940:10) identifies the species in Hylebos Creek as silver or coho salmon (*Oncorhynchus kisutch*), one of four salmon species fished for by the Puyallup and Nisqually peoples. These different foods were cooked by one of six methods: boiling, "steam-baking," "pit-baking," cooking in hot coals, "roasting whole," and "roasting open" (Smith 1940:230). Each method entailed use of a fire hearth or subsurface oven.

In this area of the southern Puget Sound, the coastal adaptation of the horse culture was most highly developed, a transportation advantage that supplemented aquatic movement of goods and

individuals in late prehistory (Smith 1941:203). The Puyallup and Nisqually affinity for horses is perhaps related to the lush pasturage of their valleys and prairies, as well as to a traditional affiliation with Plateau groups such as the Yakama (Boxberger 1984:113; Harrison 1887:89; Gibbs 1967:14). It appears that Nisqually bands were somewhat more inclined toward horse ownership than the more saltwater and riverine-adapted Puyallup Indians (Smith 1940:115). Although much of Puyallup-Nisqually territory was a rainforest-like tangle, vegetation on prairies was managed by routine controlled burning (Leopold and Boyd 1999:139-163).

Historic Settlement and Development

A succession of events bridge the aboriginal and post-contact settlement periods in Puget Sound, including initial Euro-American "discovery," fur trader activity, and the formation of nearby Indian reservations. Widespread White settlement of the Puyallup River valley did not occur until after 1860 when the region was more generally known and native groups had been encouraged to move to federal reserves. Maritime explorations of the Washington coast were undertaken after 1770 by Spanish, English, and American interests to evaluate the colonization and economic exploitation potential. However, Hudson's Bay Company (HBC) establishment of Fort Nisqually in 1833 marked the first significant non-native settlement in proximity to the SR 167 project APE.

Fort Nisqually, situated near present-day DuPont, was constructed midway between coastal HBC settlements Fort Vancouver (1824) and Fort Langley (1827) as a halfway station and fur collection point. Its various facilities served those and other vital economic and social purposes until British withdrawal from American territory after ratification of the Oregon Treaty of 1846. While the local fur trade era was thereby limited, a legacy was established by former HBC employees who continued to subsistence farm and raise families with their Indian wives in the area surrounding Fort Nisqually. Those pioneers were soon joined by American and other settlers seeking to claim land via the Oregon Donation Land Act of 1850 and subsequent "settlement laws" affecting public domain lands.

In 1852, Nicholas Delin located a Donation Land Claim (DLC) at the head of Commencement Bay, an area now included within the Tacoma city limits (Hawthorne 1893:365-367). A dozen or so DLCs were subsequently taken up near the south end of the project area on land near the Puyallup River or on land now within the Puyallup city limits. The closest DLCs to the proposed highway improvements are Land Claims 42, 43, 44, 46, 47, and that of John Carson. The latter obtained property on the north bank of the Puyallup River in Sections 15, 21, and 22, T20N, R4E during 1853 (GLO 1864a). He is perhaps best known today for his association with a large chestnut tree believed to be the sole remaining feature of his claim. The Carson Chestnut Tree is located at the east end of the project ROW (see Figure 1). The tree was recorded on a Washington State Historic Property Inventory form and nominated to the Washington Heritage Register (Luttrell 2001, revised 2005:Appendix B) as a result of previous SR 167 Project cultural resources investigations.

Carson's 316-acre DLC adjoined a military road that connected the early Steilacoom settlement with Bellingham Bay. Besides farming, Carson operated a private ferry for the roadway crossing

(Evans 1889:244). Due to Indian uprisings in late 1855, local settlers, including the Carson family, fled to Fort Steilacoom. Carson was elected as a Democrat to the Washington Territory House of Representatives for the 1855-1856 Legislative Assembly session. Military blockhouse construction on the Puyallup River's south bank began on February 14, 1856; the blockhouse was to guard the ferry and "keep open the communication between Fort Steilacoom and Muckleshoot [Prairie]" (Evans 1889:244):

> Between the sides of the river a government boat was used for the crossing of the troops and supplies. To Mr. Carson was committed the charge of that ferry boat. To protect his side of the river, he raised an independent company, consisting of 23 volunteers, of which he was captain. They refused to be mustered into the United States service, but acted as a garrison for the defense of the settlement. They were provisioned by the United States regulars at Fort Steilacoom, and provided with arms from the United States steamer Massachusetts [Evans 1889:244].

The blockhouse, also known as Fort Malone, was located on the south bank of the Puyallup River across from the Carson DLC (Evans 1889:244). After the settling of the local Indian War of 1855-1856, Carson and his neighbors resumed development of their land claims. He then, under charter by the Territorial Legislative Assembly, constructed a wooden toll bridge at the former ferry crossing. Its service period was short, however, as the bridge was swept away by floodwater in the winter of 1862-1863. A ferry was subsequently re-established under license to Carson from the Pierce County Commissioners. The existing bridges are but the latest means of crossing the Puyallup River at this point.

The Native American difficulties mentioned earlier occurred less than a year after the signing of the Treaty of Medicine Creek in December 1854. That agreement created the Puyallup, Nisqually, and Squaxin reservations. The nearby Muckleshoot Reservation was established by executive order in 1857 and later expanded in 1873, but even then, not all Indians relocated to the newly created reservations. Although the Puyallup retained some of their traditional homeland within their federal reserve, the reservation's very presence was seen as an obstacle by some historic-period observers.

As early as 1864, a General Land Office (GLO) surveyor noted that there were about 40 settlers in T20N, R4E, "many of whom have large clearings and all appear to be prospering; they suffer however, in consequence of the Indian Reservation, which in a measure completely cuts off all communication with the [Puget] sound" (GLO 1864b). The surveyor went on to state the quality of land in the township as far above "the common average" with fir, cedar, and hemlock in the uplands, and alder, balm, vine maple, and ash in "the bottom lands" (GLO 1864b). A heavy undergrowth of young trees, salmonberry, and vines was also noted.

Off the reservation on the Puyallup River's right bank near John Carson's land claim, the village of Franklin included a general store, post office, and hotel in 1864. And it was reported that a telegraph line between Olympia and Seattle was under construction through the township (GLO 1864b). The Franklin post office had been established on November 19, 1860 (Landis 1969: W:31). Franklin was the community forerunner to present-day Puyallup (Meany 1923:237).

Rapid historic-period acculturation of Puyallup Indians into the dominant lifeways of Whites is well documented by Smith (1963) and earlier observers, such as Harrison (1887). The latter

author provides an informed first-person account of the Puyallup Reservation 32 years after its creation, stating that the reserve then contained about 560 Indians:

> These Indians have never had Government rations. Their treaties gave them annuity goods, but none of the Indians west of the Rocky Mountains have ever had rations. They have always been self-supporting. (This statement is given by Mr. [Edwin] Eells's authority.) These Puyallup people have good land. I saw thirty or forty Indian farms. They farm about as well as white people. Nearly all have framed houses, built by themselves, all with good floors. When Mr. Eells came to the reserve there were no framed houses, no civilized floors. They grow wheat and barley; their heaviest crops are hay, potatoes and oats. Corn does not ripen. All kinds of vegetables grow abundantly. Some Indian men sell from $50 to $75 worth of strawberries each year from their own lots. Apples, plums, pears, cherries, prunes and currants, and black rasp and gooseberries are all fine and abundant. Three-fourths of these Indians speak English enough for business and convenient intercourse. They have two eight-horse power threshing machines, seventy-five or one hundred wagons, all paid for by Indians, and forty or fifty sewing machines. They use clocks, knives and forks, etc. [Harrison 1887:90, 98-99].

The Puyallup Reservation was but one reserve within the Puyallup Indian Agency. Other agency reservations included the Nisqually, Shoalwater, Squaxin, Quinault, and Skokomish. Most, but not all, of the land in the Puyallup Reservation had been allotted to Native Americans by 1893:

> Puyallup Reservation – Original size, 18,062 acres; present size, 585 acres; allotted, 17,477 acres; population, 609; all citizens; one Presbyterian and one Catholic church [Washington State World's Fair Commission 1893:76].

After the turn of the nineteenth century, large tracts of reservation land left Indian control by Acts of Congress ending trust status of lands, foreclosure or tax sale, and/or forced sales creating new additions to Tacoma. Native American-claimed tidelands were lost as those lands were patented by the State of Washington, the end result being a disjointed reserve and compromised economic opportunities for the Puyallup (U.S. Senate, Select Committee on Indian Affairs 1989:90).

Agricultural methods for growing non-indigenous plant species were first introduced by the HBC at their forts, farmsteads, and commercial farms and continued locally as new waves of settlers came into the Puyallup River valley to till the rich land. However, not all of these newcomers were farmers and local settlement developed along two parallel tracks, one urban and the other rural. The antecedent to Puyallup has already been mentioned, but little has been said concerning nearby Tacoma, one of Puget Sound's most significant industrial cities. Situated on the west shore of Commencement Bay, Tacoma began with Nicholas Delin's DLC and a small, water-powered sawmill built by the partnership of Delin and Michael T. Simmons in 1853 (Hawthorne 1893:369).

The shipping potential of Commencement Bay was readily apparent, but a lack of settlers and dense timber hindered early community development. General Morton M. McCarver is credited as the city founder and Tacoma was granted a post office on March 25, 1869 (Meany 1923:299; Landis 1969:W:84). The choice of Tacoma as the western terminus of the Northern Pacific Railroad (NP), was largely due to McCarver's efforts and townsite development thereafter

flourished (Hawthorne 1893:381-383). The growing city was soon associated with an important port development.

Before long, Tacoma was shipping enormous volumes of natural resources including eastern Washington grain. Export statistics for 1886-1887 included 54,863,018 board feet of lumber and 219,556 tons of coal, while 3,000 linear feet of new warehouses were being constructed to house grain shipped on the NP (*The West Shore* 1887a:639, 1887b:92). By 1909, the city's population was approaching 90,000 with the Tacoma smelter as one of the larger industrial employers (Davis 1909:43). Beyond its rail connection with the NP, Tacoma received a second transcontinental railway with the arrival of the Chicago, Milwaukee and Puget Sound Railroad Company's Black River Junction to Tacoma trackage in 1909 (Cheever 1949:84). Later known as the Chicago, Milwaukee and St. Paul Railroad or Milwaukee Road, the railroad is best known for its electric technology after 1911.

Tacoma was also linked to Seattle via a small electric railroad first named the Seattle-Tacoma Interurban Railway. A 36-mile-long route, plus a short branch to Renton, was completed on October 5, 1902. Later operated as the Puget Sound Electric Railway, the line ultimately suffered from automobile and bus competition and was abandoned at the end of 1928 (Hilton and Due 1964:392). The line crossed the SR 167 project area in the vicinity of Freeman Road.

Other than Tacoma and Puyallup, the only other significant historic city with direct bearing on the SR 167 project area is the smaller town of Fife. This former rural community is one of many small agricultural centers that developed in the Puyallup River valley. Fife was reportedly founded in 1883, although it did not gain a post office until May 12, 1900 (Heritage League of Pierce County 1990:68; Landis 1969:W:29). The town's namesake is identified as Colonel William J. Fife, an early settler and entrepreneur. After the turn of the nineteenth century, incoming settlers to the Fife area included Japanese and Italian farmers. The latter established the first named truck farm in 1906, Colonial Gardens (Heritage League of Pierce County 1990:68).

Fife evolved into the hub of an agricultural district of dairies, chicken ranches, bulb and berry operations, and vegetable truck farms. A growing business center and residential area included churches, hotels, general stores, and dance halls (Heritage League of Pierce County 1990:68). The total value of farm products from the Puyallup Valley equaled more than $5,000,000 in 1928 (*The Tacoma Daily Ledger* 1929:Section 3:1). At that time, Fife was considered one of the fastest growing areas in Pierce County (*The Tacoma News Tribune* 1929:21).

Construction of Highway 99 (SR 99) divided the town in half, but also increased its accessibility from Tacoma and Seattle. By 1941, Fife also served as a bedroom community for manufacturing workers in Tacoma. It was a place where one could afford a home and small acreage for "truck gardening" (*The Tacoma News Tribune* 1941:9). Nearby Puyallup is the largest community in the Puyallup River valley. At an earlier time and on a much larger scale than Fife, Puyallup grew from tiny Franklin into a large urban center surrounded by productive farms.

Farming in the Puyallup vicinity began with the first clearings by DLC claimants and other homesteaders. Pioneer Ezra Meeker is credited with introducing hops to the area in 1865. Some

idea of the resulting production is provided by a regional newspaper, "the hop-picking season has begun over on the Puyallup. There are now about 900 Indians and 200 Chinamen at work there, and 400 more are wanted" (*Washington Independent* 1876:2:4). Vast acres were subsequently planted in hops, but a parasite invasion in 1891 severely compromised the local reliance on a single cash crop. More diversified farming followed with berries, hops, cherries, pears, and vegetables cultivated (Hawthorne 1893:417; Snell 1907:91).

Lands and buildings associated with the Western Washington Experiment Station are also included in the project area. This facility was created by the state legislature as part of the State College of Washington (Washington State University). That legislation included one experiment station in western Washington. Development began in 1895 when 60 acres were acquired for use in researching crop problems such as disease control (Bonney 1927:1095). Agricultural research at the Western Washington Research and Extension Center continues to the present day.

Contemporary development is drastically changing project area land uses. Such development includes commercial, industrial, and warehouse construction on former farm and residential land. The Fife business district has expanded; few farms are now located within its vicinity. Level land once favored for its rich soil is now desired for large manufacturing and product distribution complexes accessible from nearby highways and by Port of Tacoma shippers. These evolutionary land use changes are occurring at an unprecedented pace.

Previous Cultural Resources Research

Multiple cultural resource studies have been completed to date in the project area, including those associated with earlier phases of the SR 167 Puyallup to SR 509 project. A county-wide inventory of historic structures was undertaken by Pierce County in the early 1980s and some of those properties are extant in the project area (Gallacci 1982). Two other relevant studies of historic structures are those by Garris (1995) and Lentz (1995). Previous investigations undertaken for WSDOT for other nearby transportation projects are limited to those conducted by Robinson (1984, 1986, 1990). WSDOT's past studies in the SR 167 project vicinity include Robinson (1991, 1992, 1999), Holstine and Robinson (1992), Luttrell (1992a, 1992b, 1992c), and Kiers and Holstine (2012).

The previous SR 167 Project studies were undertaken between 2000 and 2005 to support development of the Tier II FEIS. Numerous cultural resources investigations, including a "sites of cultural significance" study, were carried out as part of the FEIS process. Those investigations results are presented in Luttrell (2001) which was revised in 2005, in part, to include other related reports as appendices to the 2001 volume.

A series of investigations was conducted near or directly adjacent to the project APE subsequent to the FEIS studies. These investigations are reported in Berger (2014a, 2014b), Berger et al. (2008), Cooper (2009), Cowan and Montgomery (2011), Diedrich (2012), Early (2008), and Ferland (2010).

Cultural Resources in the Project APE

Previously recorded cultural resources in the current project APE that were documented in the Tier II FEIS are prehistoric site 45PI488, the Carson Chestnut Tree, and the SR 167 Puyallup River/Meridian Street Bridge (see Figure 1). Prehistoric site 45PI488 was determined eligible for listing in the NRHP by WSDOT in 2003. A Washington Heritage Register of Historic Places (WHR) nomination form was prepared for the Carson Chestnut Tree recommending it eligible for listing in the WHR. It is not listed on the WHR according to Department of Archaeology and Historic Preservation (DAHP) records available through the on-line Washington Information System for Architectural and Archaeological Records Data (WISAARD) database. The bridge was determined not eligible for listing in the NRHP as part of previous project investigations although recent evaluation of the Meridian Street Bridge indicates that it is NRHP eligible under Criterion C (Kiers and Holstine 2012). The bridge has been removed from the river crossing and is currently staged within the project APE prior to its sale.

Research Design

Those portions of the project APE in the RA corridor that were not part of the 2000-2004 FEIS alignment (i.e., the 2015 project area) were surveyed and shovel tested for archaeological resources during the current phase of investigations. A built environment survey of the project APE was conducted to identify and record buildings/structures not addressed during the FEIS phase, or that have reached the 45 year threshold in the interim. In addition, shovel tests were excavated to refine the boundary of buried prehistoric site 45PI488 discovered during the previous investigations.

Methods

Archaeological field work entailed a 100 percent walking survey of the unpaved portions of the 2015 project area, RA outside of areas surveyed for the FEIS (approximately 240 acres). Transects no wider than 30 meters were walked by cultural resource professionals to determine the presence/absence of previously unrecorded cultural resources. In addition to the walking survey, shovel testing was conducted in WSDOT owned parcels.

Shovel tests were excavated at 30 meter intervals along test lines spaced 30 meters apart. Each shovel test measured 30 to 40 cm (12 to 16 in) in diameter. Shovel tests were excavated to shovel limitations, generally 80-100 cm below the ground surface. All excavated sediments were screened through ¼-inch-mesh hardware cloth. Pertinent information regarding shovel test stratigraphy, excavated depth, and the presence/absence of cultural materials was recorded on standard AHS forms. Project boundaries and shovel test locations were verified using GPS-generated Universal Transverse Mercator coordinates (UTMs).

Shovel test excavations in parcel 134 in 2000 resulted in identification of prehistoric site 45PI488 which was determined eligible for listing in the NRHP by WSDOT in 2003. Additional shovel tests were excavated in parcel 134 and adjoining parcels, for which permission to excavate was not in place during the FEIS phase of project APE investigations, to refine the site boundary. Shovel tests in these parcels were excavated at 20 meter intervals along test lines spaced 20 meters apart with additional exploratory shovel tests placed as needed.

The built environment survey entailed review of Pierce County Assessor's Office records and a field visit to identify previously unrecorded buildings/structures over 45 years of age in the project APE. Buildings/structures meeting these criteria were recorded on Washington State Historic Property Inventory forms through the DAHP on-line WISAARD database (see Appendix C).

Descriptive notes were compiled and representative photographs were taken depicting landscape appearance and the nature of soils within the 2015 project area. All photographs, field notes, maps, correspondence, and other records generated during this study are on file at the AHS office in Cheney.

Results

A total of 126 parcels (approximately 240 acres) are within or partially within the 2015 project area. Each parcel is identified by a P (parcel) number (see Appendix B). The 2015 project area includes wetlands, farm fields, dense wooded areas, residential and commercial properties, and paved parking lots and roads.

Much of the 2015 project area has been heavily disturbed. Disturbances include cuts and fills related to the numerous roads through the project APE, SR 509, SR 99, I-5, and smaller arterials. Hylebos and Wapato creeks cross the project APE; both have been channelized in some locations. Many parcels have been mechanically leveled (since the FEIS investigations), or are landscaped and include paved areas.

Several of the parcels contained areas inaccessible for survey due to standing water or saturated sediments (Figure 2), impenetrable vegetation (predominantly blackberry) (Figure 3), slopes of over 40 percent (Figure 4), a celery crop (Figure 5), and/or fencing. Maps in Appendix B illustrate the un-surveyed locations in the 2015 project area. A total of 34.6 acres of the 240 acre 2015 project area (14 percent) could not be surveyed during the fall 2015 field work. Of that acreage, it is recommended that 20.2 acres (58 percent of the un-surveyed acreage) need not be surveyed due to steep slopes or impenetrable vegetation in locations where adjacent survey and shovel testing yielded no cultural material. Recommendations for the remaining 14.4 un-surveyed acres are presented below by parcel. No cultural resources were identified as a result of the 2015 project area archaeological survey. Results of the built environment survey are presented below.



Figure 2. *Overview of standing water in parcel 211, view to the south.*



Figure 3. *Overview of impenetrable vegetation in parcel 218, view to the south.*



Figure 4. *Overview of steep hillside along Hylebos Creek in parcel 89, view to the east.*



Figure 5. *Overview of shovel testing in parcel 190 adjacent to celery crop, view to the south.*

Shovel Test Results

Shovel testing was conducted on WSDOT-owned parcels. A total of 358 shovel tests (numbered 1 through 358) were excavated across 31 WSDOT-owned project APE parcels (see Appendix B), in active and fallow farm fields, dense wooded areas, and large grassy fields. An additional 19 shovel tests (numbered 1 through 19) were excavated around prehistoric site 45PI488. Results of the site boundary investigation are presented below. Some planned shovel tests were not excavated due to standing water or water saturated sediments, impenetrable vegetation, or crops.

Sediments in the 2015 project area generally consist of a brown to dark brown, disturbed A-horizon or plow zone, overlying gray alluvial compact silts and fine sands with heavy soil mottling. Very few gravelly deposits were found in the sediments except in areas where gravels had been imported. Modern disturbance in the form of imported fill material and trash and other modern debris was observed in many of the shovel tests near urban areas and roads. See Appendix D for specific shovel test information.

The high water table in several areas surveyed resulted in termination of 114 shovel tests (32 percent) before reaching 1 meter in depth. Some parcels were heavily landscaped, often times exhibiting a fill layer over a large area, such as in parcels 601, 601A, 604, and the northern portion of parcels 223 and 222. An 80-cm- to 100-cm-thick fill layer consisting of coarse gravelly sand containing asphalt chunks and other modern debris covered a portion of parcels 601 and 601A along Hylebos Creek. Only 7 percent (n=26) of the shovel tests were terminated due to sediment compaction or other obstructions. Sixty-one percent (n=218) of shovel tests were terminated at approximately a meter in depth, the extent of hand excavation possible with a shovel. The average depth for the 358 shovel tests excavated was 88 cm. Shovel tests (see Appendix D) did not result in the identification of any new cultural resources.

For another recent project not associated with the SR 167 investigations (Berger et al. 2008), mechanical excavation of test pits and soil bores located immediately east of SR 509 were monitored by an archaeologist (Diedrich 2012). Some of these previous excavations were located immediately to the north and south of parcels 8 and 9 (Diedrich 2012:5, 7).

> Of the 61 test pits, 20 consisted entirely of fill material; 13 of these were located on high berms, which surround the perimeter and extend across the northern portion of the site. The remaining 41 test pits reached native sediments. Surface fill consisted of approximately 6 inches of rooty sod in gravelly and cobbly light brown silty sand, changing to hydraulic fill gray silt at 4 – 5 feet below surface . . . . The native sediments averaged 8 feet below surface in depth (with a minimum 5 feet and a maximum 11 feet below surface), and were made up of a dense black organics stratum composed of the remains of rushes, sedges, and grasses, with a distinct upper interface, diffusing to dark gray silt over interbedded silt-sand alluvial deposits . . . Three of the test pits contained two organics layers. In these, the upper organics strata were considered more recent deposits, examples of perhaps two discrete fill episodes with plant growth between, and only the second deeper, thicker, organics layer was recorded as native. No cultural material was observed within the native sediments.
>
> Bores B16, B17, and B18 were located on a very high gravel berm, and contained fill to depths of 20 – 30 feet, native sediments below. The remaining seven bores hit native sediments at 8 – 10 feet below surface, consistent with test pit data. Native sediments in all bores were composed of

> an upper strata of organics diffusing to interbedded silt-sand alluvial deposits that extended to the final depth of bore, ranging 20 – 50 feet below surface. Two bores extended to 100 feet in depth, but one was atop the high gravel berm extending across the northern portion of the site. One of the 100 feet bores, B11, was located near the middle of the site and contained shell fragments at depths of 90 – 95 feet below surface. All other samples of alluvial deposits were clean sand and silt [Diedrich 2012:2].

While no cultural materials were observed within native sediments, these previous excavations indicated fill in areas adjacent to parcels 8 and 9 ranges from 8-10 feet deep.

Site 45PI488 Boundary Delineation

In addition to the 358 shovel tests within the RA 2015 project area, 19 shovel tests were excavated in parcels 133 and 134 to refine the site 45PI488 boundary (Figure 6). These shovel tests were sequentially numbered (1 through 19). Parcels 133 and 134 consist of relatively open grassy areas. Parcel 135 is a paved lot with a 100 percent impervious surface. Once right-of-entry is obtained for parcel 743, across SR 99 from the site, a shovel test may be excavated there to demonstrate whether the site extends that far south. Extensive disturbance related to the construction and maintenance of SR 99 likely precludes evidence of the site in this area, even if it once existed (Figure 7). Parcel 743 shovel test excavation is not necessary at this time, but should be conducted prior to ground disturbance and construction.

Twelve shovel tests were excavated in a 20 x 20 meter grid over parcels 133 and 134. Shovel test 9, to the north of the previously defined site boundary, contained one small fire-modified rock (FMR) fragment found 30 cm below the present ground surface (Figure 8). Three additional shovel tests (13, 14, and 15) were excavated 5 meters east, west, and north of shovel test 9. Shovel test 13 also contained a small fragment of FMR in the upper 20 cm (Figure 9) and shovel tests 16, 17, and 18 were excavated 5 meters east, west, and north of shovel test 13 (see Figure 6). Shovel test 19 was excavated between the southern site boundary and SR 99: no cultural material was identified.

Sediments in shovel tests in this area were generally brown silty fine sands (Figure 10). The FMR recovered from shovel tests 9 and 13 was recorded on standard AHS forms, photographed, and placed in Ziploc bags and backfilled in the appropriate shovel test in the upper 40 cm. No additional cultural material was identified. As a result of this shovel testing, the site boundary has been extended approximately 10 meters north of its original dimensions to include the locations of shovel tests 9 and 13.

Built Environment Survey

The built environment survey of the project APE was conducted to identify, record, and evaluate buildings/structures not addressed during the FEIS phase, or that have reached the 45 year threshold in the interim. The Pierce County Assessor's Office database was accessed to gather real estate information on each property, including dates of construction. Table 1 presents a listing of the properties; each property is identified by an arbitrary field number which appears on Appendix B maps, indicating the property location. A total of 65 structures were recorded

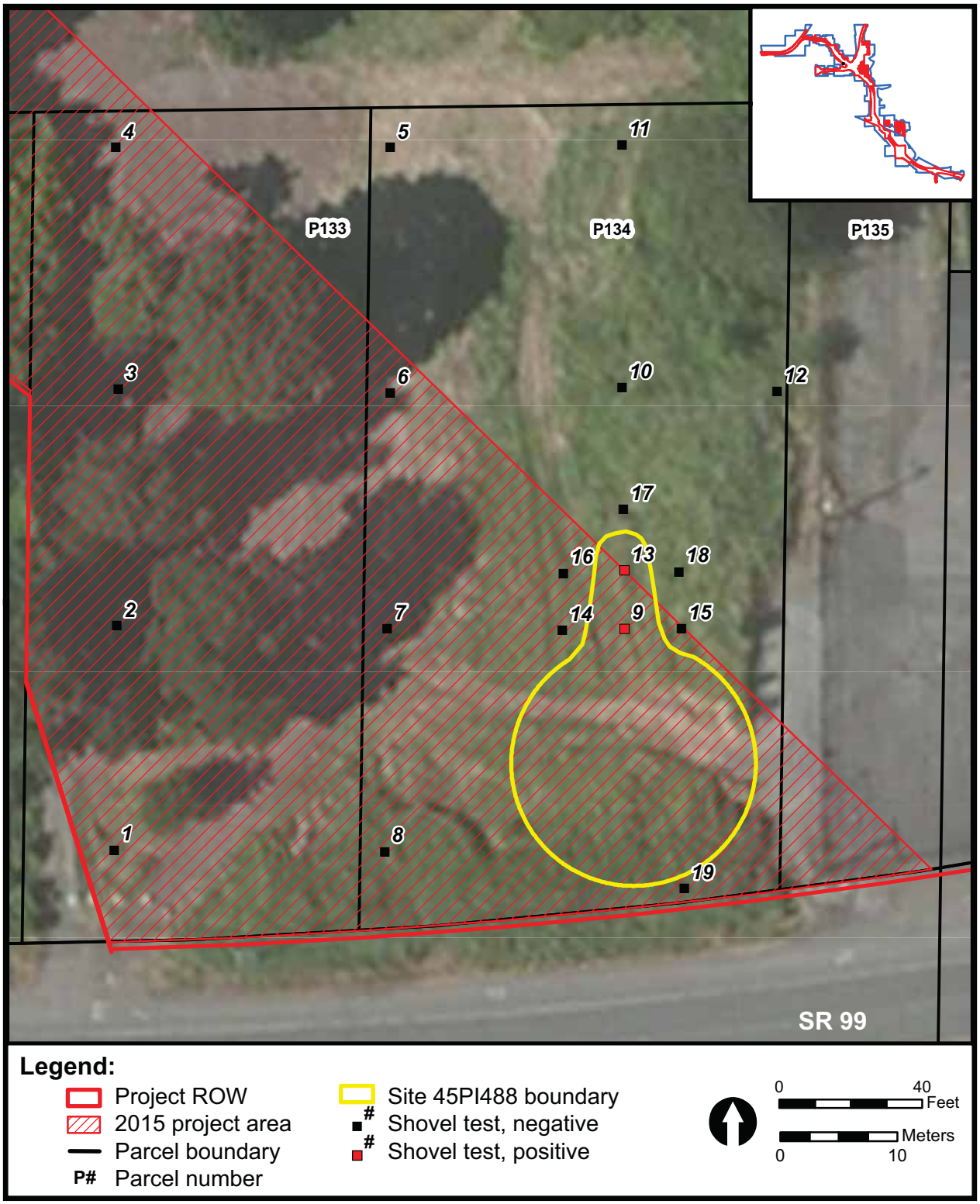


Figure 6. *Aerial photograph showing shovel tests excavated in the site 45PI488 area and the updated site boundary.*



Figure 7. *View of parcel 134 and site 45PI488 area from the south side of SR 99, view to the north.*

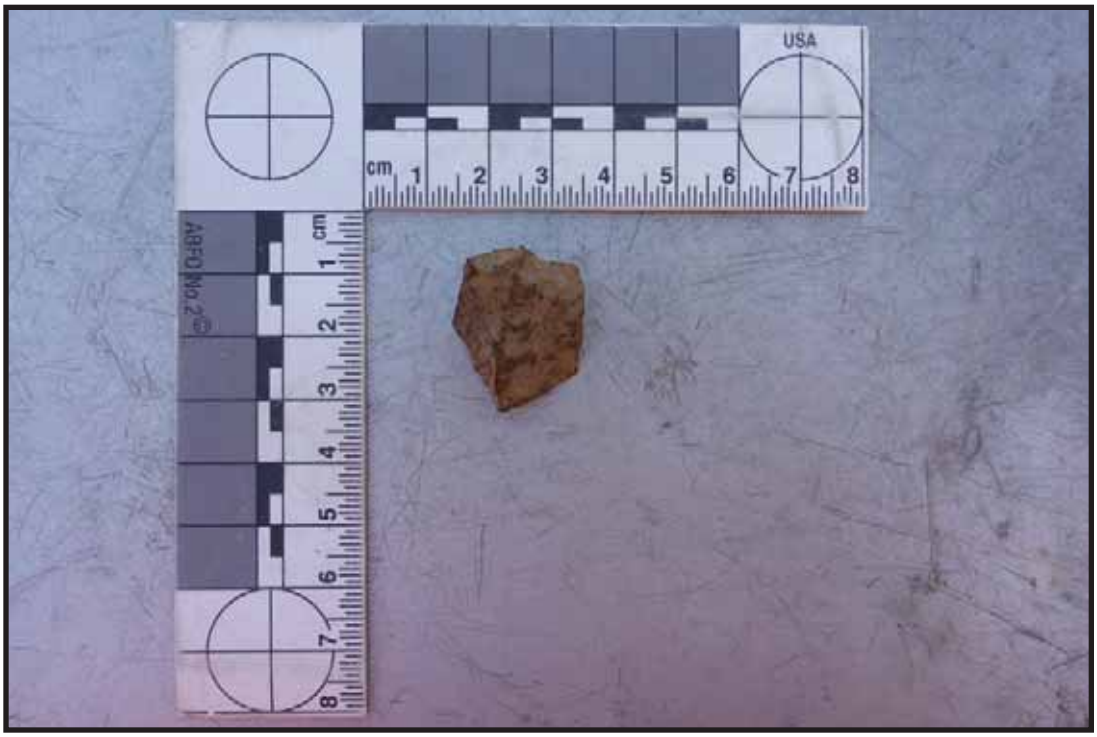


Figure 8. *The FMR fragment from shovel test 9 at site 45PI488.*



Figure 9. *The FMR fragment from shovel test 13 at site 45PI488.*



Figure 10. *View of shovel test 9 sediments. The trowel points to the north and the bar scale is one meter long.*

and evaluated. During the built environment survey, each was photographed using a digital camera and notes were taken concerning appearance and construction materials. Washington Historic Property Inventory (HPI) forms were completed for each evaluated structure. The forms are presented in Appendix C by field number.

Table 1. Buildings/Structures over 45 Years of Age in Project APE Recorded Fall 2015.

Field No.	Address	Figure	Field No.	Address	Figure
1	3401 12th Street E	B.2	2	5302 4th Street E	B.5
3	5312 4th Street E	B.5	4	5416 4th Street E	B.5
5	506 56th Ave. E	B.5	6	415 54th Ave. E	B.5
7	501 54th Ave. E	B.5	8	520 54th Ave. E	B.5
9	602 54th Ave. E	B.5	10	606 54th Ave. E	B.5
11[a]	6020 8th Street E	B.6	12	1223 67th Ave. E	B.7
13	6708 Pacific Highway E	B.7	14	423 Porter Way	B.12
15	422 Porter Way	B.12	16	709 5th Ave.	B.12
17	511 4th Ave.	B.10	18	326 Emerald Street	B.10
19[a]	411 Birch Street	B.10	20	416 Birch Street	B.10
21	3821 Freeman Road E	B.19	22[a]	4403 Freeman Road E	B.19
23	4407 Freeman Ave. E	B.19	24	8319 Valley Ave. E	B.19
25	8719 42nd Ct. E	B.20	26	4119 90th Ave. E	B.20
27	4411 90th Ave. E	B.20	28	4211 90th Ave. E	B.20
29	4119 90th Ave. E	B.20	30	4608 86th Ave. E	B.22
31	4522 86th Ave. E	B.22	32	5822 108th Ave. Ct. E	B.26
33	5819 108th Ave. Ct. E	B.27	34	10825 58th Street Ct. E	B.27
35	10917 58th Street Ct. E	B.27	36	11003 58th Street Ct. E	B.27
37[a]	6007 Milwaukee Ave. E	B.27	38	6008 Milwaukee Ave. E	B.27
39	6014 Milwaukee Ave. E	B.27	40[a]	6020 Milwaukee Ave. E	B.27
41	6306 7th Street Ct. E	B.6	42[a]	860 64th Ave. E	B.6
43	2417 Freeman Road E	B.16	44	7228 Valley Ave. E	B.18
45	4815 Freeman Road E	B.21	46	4823 Freeman Road E	B.21
47	4827 Freeman Road E	B.21	48	4917 Freeman Road E	B.21
49	8218 49th Street E	B.21	50	4923 Freeman Road E	B.21
51	5001 Freeman Road E	B.21	52	5005 Freeman Road E	B.21
53	8305 49th Street E	B.21	54	8319 49th Street E	B.21
55	8320 49th Street E	B.21	56	1124 Valley Ave. NW	B.22
57	10903 Morning Side Dr. E	B.27	58	10911 Morning Side Dr. E	B.27
59	11009 Morning Side Dr. E	B.27	60	11108 Morning Side Dr. E	B.27
61	5117 Freeman Road E (House 3)	B.21	62	5123 Freeman Road E	B.21
63	5117 Freeman Road E (House 4)	B.21	64	8212 49th Street E	B.21
65	4923 Freeman Road E	B.21			

[a] Recommended eligible for listing in the NRHP

Some structures in the project APE were associated with past agricultural activity in the Puyallup River valley. These consisted of incomplete remnants of long past activity, including some farm houses. Deteriorating remnants of fences and out-buildings are scattered throughout some areas,

none of which retain a direct association with their agricultural past. The majority of the buildings were houses. Nearly all were located in former residential neighborhoods that have been considerably marginalized by modern development and road construction. Most have been altered in some way, compromising their architectural integrity. The most common modification appears to be replacement of original wood sash windows with vinyl or metal sashes, which are less susceptible to damage in the moist environment of western Washington.

Applying criteria developed by the National Park Service, and presented in National Register Bulletin 16A, it was determined that six properties of the 65 properties recorded are eligible for listing in the NRHP, based upon the integrity of their architecture, historic appearance, and original construction materials. The six NRHP eligible properties are described below.

6020 8th Street E (Property No. 11)

This house is a 1-story wood frame building with a rectangular plan (Figure 11). The hipped roof has a very shallow pitch and is covered with composition shingles. A rectangular cross-section brick chimney emerges from near the roof crest. The eaves are widely overhanging and enclosed. The foundation is poured concrete. Exterior wall surfaces are clad with brick. The central front entry and the primary picture window are placed beneath a hip-roofed canopy supported by two wood posts. The wood sash windows include both picture and casement types. At the far right is the wood roll-up door of the attached garage.

This residence was built in 1955, just as America's love affair with the Ranch Style was achieving full impetus. Diagnostic elements of the style exhibited here include the shallow-pitched roof, the large masonry chimney, the enclosed and widely overhanging eaves, and the attached garage. This is a classic rendition of the hip-roofed, brick clad version of the Ranch Style. The remarkable clarity of the horizontal lines and the uncomplicated presentation of the architectural features are what give this house the distinction necessary for NRHP eligibility.

411 Birch Street (Property No. 19)

This house is a 1-story wood frame building with a rectangular, front-gabled plan (Figure 12). The roof is covered with composition shingles and features widely overhanging eaves with exposed rafter ends, while ornamental cut-out barge boards are present in the gables. Exterior wall surfaces are clad with coursed wood shingles. At the front of the house is a full-width front porch. The roof here is supported by an open M-truss that serves a decorative as well as a functional purpose. The truss is in turn supported by battered wood posts with shingle cladding. The wood deck of the porch is supported by newer concrete piers. Attached to the rear of the house is an enclosed back porch with a hipped roof. The windows are wood sash and include mostly picture and double-hung units. There is a diamond-shaped, fixed wood sash window on the west elevation. On the east elevation is a pop-out bay window with a gabled roof and ornamental barge boards, and knee braces for further support.

If this house was indeed constructed in 1900, as stated in real estate records, it is a very early example of the Craftsman Style, which dominated residential design into the 1930s. Classic elements of the style seen here include the widely overhanging eaves, exposed rafter ends, barge



Figure 11. *Mattich residence, 6020 8th Street E, north (front) and east elevations, view to the southwest.*



Figure 12. *Bean residence, 411 Birch Street, north (front) and west elevations, view to the southeast.*

boards, and full-width front porch with battered post supports. The concrete front porch deck supports are new, but otherwise this building retains excellent integrity of both its historic appearance and original construction materials. As an outstanding and early example of a Craftsman house, it is eligible for listing in the NRHP.

4403 Freeman Road E (Property No. 22)

This residence is a 1-story building with a rectangular plan that includes an attached garaged in the rear space (Figure 13). The shallow-pitched, hipped roof is covered with composition shingles and has widely-overhanging enclosed eaves. A massive brick chimney, with three pots, is situated on the south slope, while a smaller brick chimney is located on the back slope. Exterior wall surfaces are clad with brick. The foundation is poured concrete. The left side of the front facade is recessed beneath the roof. The front entry is to the right of this recess. The wood panel front door is approached by rounded concrete steps. Large wood sash picture windows are located on the west (front) and south elevations. Other windows are metal sash sliding units, except for a unique glass block window on the north elevation. All windows feature brick header sills. Another brick component is a planter along the right side of the facade.

This house was built in 1953. It is an early example of the Ranch Style, which would gain in popularity in the decade to come. Classic elements present are the shallow-pitched roof with widely-overhanging, enclosed eaves, the massive masonry chimney, and the attached garage. The brick header sills and the brick planter are common elements of the brick version of the Ranch Style. The metal sash units of the smaller windows are probably not original. Nevertheless, there is enough integrity of historic appearance and original construction materials to make this house a good candidate for listing in the NRHP.

6007 Milwaukee Avenue E (Property No. 37)

This residence is a 1 ½ -story wood frame building with a rectangular plan (Figure 14). The side-gabled roof is covered with composition shingles and has moderately-wide, open eaves that feature exposed rafter ends and purlins. A brick chimney emerges from the back roof slope. All exterior wall surfaces are clad with horizontal clapboard siding and the foundation is poured concrete. All windows are wood sash and include fixed and double-hung units, some with multiple panes. The wood panel and glass front door is centered beneath a wide gabled canopy supported by battered wood posts resting on piers clad with stone veneer. At the rear of the house is an enclosed back porch with a gabled roof. Behind the house is a modern, metal-clad garage.

This house was built in 1928, as the Craftsman Style was gaining in popularity. Diagnostic elements present include exposed rafter ends and purlins in the open eaves, and the large front porch canopy with masonry piers and battered posts. Some siding of the front porch was missing at the time of survey but is being replaced with appropriate materials. This is the only sign of diminished architectural integrity. The fact that all of the wood sash windows are present, in an area of residential neighborhoods where almost all original windows have been removed, makes this house a good candidate for NRHP eligibility.



Figure 13. *Boitano residence, 4403 Freeman Road E, west (front) and south elevations, view to the northeast.*



Figure 14. *Ramage residence, 6007 Milwaukee Avenue E, west (front) elevation, view to the east.*

6020 Milwaukee Avenue E (Property No. 40)

This house is a 1 1/2-story wood frame building with a rectangular plan (Figure 15). The front-gabled roof is covered with composition shingles and features widely-overhanging, open eaves with exposed rafter ends, fascia boards, and exposed purlins in sets of three, staggered in length. A brick chimney emerges from the roof crest near the rear. Another chimney is located on the south elevation and is a full-height brick structure, corbeled near the top and penetrating the eave. A shed-roofed dormer is situated on the north roof slope. A gabled bay window is situated near the center of the south elevation. Exterior wall surfaces are clad with narrow horizontal clapboard siding. The foundation is poured concrete. A full-width, under-the-roof front porch is anchored at the corners by battered wood posts resting on brick piers. A wood railing defines the wood porch deck, while poured concrete steps are flanked by brick half-walls. The left portion of the porch contains a wood and glass entry door flanked by multiple-pane wood sash side lights. The right half of the porch contains a Craftsman Style tripartite window with wood sash, multiple-pane upper sections. Other windows are all wood sash as well and include both sliding, double-hung and, in the front gable face, casement units. Flanking the exterior chimney are small fixed wood sash inglenook windows. Flower boxes are placed beneath some of the windows. An enclosed hip-roofed porch is attached to the rear of the house.

This residence was built in 1925 and is an excellent example of the classic Craftsman Style house. Diagnostic features present include the wide, open eaves with exposed rafter ends, fascia boards, and exposed purlins, massive exterior masonry chimney flanked by inglenook windows, the full-width front porch with battered posts and brick piers, and the tripartite window of the front. All architectural elements of the exterior appear to be original, making it one of most intact Craftsman Style houses in the Puyallup Valley. It is certainly eligible for listing in the NRHP.

860 64th Avenue E (Property No. 42)

The Joe Young cabin is a rectangular log structure measuring about 16 feet by 12 feet (Figure 16). The logs of the walls are peeled and quite large, with the largest at the bottom. The logs are V-notched at the corners. The only fenestration is a wood plank door on the north (front) elevation, with iron hinges. Slabs of plywood form the roof, attached to interior log purlins and rafters. The gabled roof projects forward from the front to form a canopy before the entry, supported by upright log posts. The foundation appears to be sill logs resting directly on the ground.

On the same property, the nearby Erickson house is a 1-story wood frame building with a U-shaped plan consisting of a side-gabled portion with projecting front-gabled extensions at each end. The roof is covered with composition shingles and has short enclosed eaves. A massive brick chimney emerges from the back slope of the roof. The foundation is poured concrete. Exterior wall surfaces are clad with combed wood shingle siding, except for the recessed wall between the two gabled projections, which is clad with brick. The windows are about half wood sash double-hung and sliding units and about half vinyl multiple pane units. Southeast of the house is a wood frame garage/shed consisting of a gabled portion and a shed-roof portion, side-by-side. The roof is covered with wood shingles and has open eaves. A hip-roofed ventilation



Figure 15. *Whittington residence, 6020 Milwaukee Avenue E, east (front) elevation, view to the west.*



Figure 16. *Joe Yong cabin at 860 64th Avenue E, north (front) and east elevations, view to the southwest.*

cupola emerges from the central roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with board and batten siding. Fenestration includes sliding wood sash windows, a wood panel pedestrian door, and a lift-up vehicle door with multiple windows.

Puyallup tribal member Joe Young is associated with Puyallup Reservation allotment 174 which corresponds to the cabin and Erickson house location (Smith 1940:46, 330). Born in 1863, he provided Puget Sound ethnographic information to Arthur C. Ballard (1929:40). The Joe Young cabin is a classic example of Native American residential architecture as influenced by the HBC; the fur trading venture operated at Fort Nisqually, where Joe Young's father was employed (Ballard 1929:40). This cabin was built in about 1900 after an older cabin on the property was destroyed in a fire (Kristine Erickson, property resident, personal communication 2015). The V-notched construction was a commonly used technique for joining corners. The plywood roof is a later addition, but is likely instrumental in the successful preservation of the cabin itself. Probably not long after construction of the cabin, Joe Young sold his land and moved on. Likely, some of his descendants are on the rolls of the Puyallup Tribe. The cabin is eligible for inclusion in the NRHP under Criterion C, as a surviving example of early log cabin construction, and under Criterion A, for its association with Native American presence in the Fife area. The original portion of the Erickson House was probably built about a decade after the log cabin, and added onto over the years, with the southern portion being the oldest. Much of the fenestration has been updated using modern materials such as vinyl. Alterations have occurred to the garage/shed as well. The house and garage/shed do not contribute to the eligibility of the Joe Young cabin.

Conclusions and Recommendations

The 2015 cultural resource investigations for the SR 167 Extension Project—Puyallup to SR 509 new freeway did not result in the discovery of any previously unrecorded archaeological sites. Shovel testing in the site 45PI488 vicinity resulted in recovery of two small FMR fragments resulting in shifting the site boundary approximately 10 meters north to include the locations where the FMR was identified. The site form was updated to reflect the boundary change (see Appendix C). It is recommended that WSDOT avoid impacts to NRHP eligible archaeological site 45PI488 and seek a finding of no adverse effect. If impacts to the site are unavoidable, we recommend data recovery excavations developed in consultation with DAHP and the Puyallup Indian Tribe.

Sixty-five properties were recorded on historic property inventory forms as a result of this investigation (see Appendix C). Six of these properties are recommended eligible for listing in the NRHP (see Table 1). It is recommended that the eligible properties discussed above be avoided, if possible, during construction activities. If impacts are unavoidable, the development of appropriate mitigation measures should be outlined in a Memorandum of Agreement (MOA) drawn up with the assistance of DAHP. The four NRHP eligible historic structures identified by Luttrell (2001, revised 2005:39), 27-4114, 27-4125, 27-4154, and 27-4160, and described in the 2006 Tier II FEIS, are no longer within the RA APE and of no further concern.

Survey could not be completed in some parcels due to impenetrable vegetation, steep slopes, saturated sediments/standing water, and/or fencing. Right-of-entry (ROE) is required to conduct shovel testing on parcels not owned by WSDOT. Similarly, shovel test excavation was not conducted on parcels for which right-of-entry (ROE) was not available. Contingent upon favorable soil moisture conditions and obtaining ROE permissions, we recommend completing survey and shovel test excavation in those parcels listed in Table 2. These investigations are not necessary at this time, but should be conducted prior to ground disturbance and construction. Appendix B maps indicate the locations of areas recommended for survey completion and/or shovel testing.

Table 2. Fieldwork Completion Recommendations, by Parcel.

Parcel No.	Figure B.__	Fieldwork To Complete		ROE	Comments	Fall 2015 Fieldwork	Pedestrian Survey Status
		STs (n=)	Survey (acres)				
5	2	2		request	heavily landscaped area near channelized creek	survey	complete
57	4	1		request	residential building and backyard	survey	complete
58	4	1		request	residential building and backyard	survey	complete
59	4	1		request	residential building and backyard	survey	complete
60	4	1		request	residential building and backyard	survey	complete
62	4	1		request	residential building and backyard	survey	complete
109	6	1		request	no structures, open area	survey	complete
110	6	2		request	residential building, landscaped	survey	complete
116	6	4	0.8	request	large densely overgrown parcel, unable to access 2015 project area in SW corner of parcel	no access	none
127	6	1	0.2	request	residential backyard, chain link fence around perimeter, no access during 2015 survey	no access	none
130	6	5	1.1	request	open area surrounded by chain link fence, no access during 2015 survey	no access	none
189	12 & 13	25	3.6	WSDOT	agricultural field, recently plowed; survey and STs in area too saturated to survey in 2015	survey/ 5 STs	partial
190	12 & 13	6	2	WSDOT	agricultural field, recently plowed; survey and STs in area planted in celery crop in 2015	survey/ 56 STs	partial
211	13	6		WSDOT	agricultural field, recently plowed; STs in area too wet to survey in 2015	survey/ 61 STs	complete
240	17	2		request	portion densely vegetated; shovel test near Wapato Creek	survey	partial
276	20	11		request	agricultural field, recently plowed	survey	complete
302	23	2		request	wooded area just north of Levee Road	survey	complete
497	18	11		request	large, open grassy field	survey	complete
498	18	10		request	large, open grassy field	survey	complete
499	18	4		request	large, open grassy field	survey	complete

Table 2, continued.

Parcel No.	Figure B.__	Fieldwork To Complete		ROE	Comments	Fall 2015 Fieldwork	Pedestrian Survey Status
		STs (n=)	Survey (acres)				
500	18	1		request	residential building, heavily landscaped	survey	complete
501	18	4		request	residential building, heavily landscaped	survey	complete
743	7	1		request	small parcel south of SR 99; across highway from site 45PI488; not in 2015 project area; shovel test to see if site present across highway	survey	n/a
784	8	6		request	open grassy field	survey	complete
881	23	5		request	adjacent to Puyallup River	survey	complete
2007	17	2		request	overgrown area next to Wapato Creek	survey	complete
n/a	19	165	6.7	request	Novak/Uchida properties large agricultural area for wetland mitigation, no parcel numbers; portion of Novak (northern parcel) too saturated to survey in 2015	survey	partial
	Totals	**281**	**14.4**				

Right-of-entry was requested and granted for some of the parcels listed on Table 2. However, the ROEs obtained by WSDOT for parcels requested were received after heavy rains precluded additional shovel testing during the 2015 fieldwork. The ROE time period granted on those ROEs obtained in the fall of 2015 ended November 30, 2015. To complete the suggested fieldwork, ROE for all the parcels listed as request in the ROE on Table 2 will need to be obtained.

In light of the thickness of Holocene alluvium in the project area, we recommend development of a plan to identify deeply buried land surfaces and potential cultural material presence in areas of great vertical APE depth. We recommend plan implementation as a component of geotechnical investigations prior to ground disturbance and construction.

Summary

Cultural resources within the SR 167 Extension Project RA that are NRHP-eligible consist of archaeological site 45PI488 and six historic structure properties: 6020 8th Street E; 411 Birch Street; 4403 Freeman Road E; 6007 Milwaukee Avenue E; 6020 Milwaukee Avenue E; and, 860 64th Avenue (see Table 1). The historic Carson Chestnut tree is not eligible for listing in the NRHP. The SR167/Meridian Street Bridge has been moved and impacts to it have been addressed in an existing MOA.

Refined Alignment cultural resources investigation significant impacts do not differ in kind from Tier II FEIS impacts (Luttrell 2001, revised 2005); however, the specific resources are different. Historic structure properties in the Tier II FEIS are no longer in the RA nor a concern of NEPA Re-Evaluation (Table 3). Archaeological site 45PI488 is the single significant resource common

to the Tier II FEIS and RA projects. Newly documented significant resources in the RA are the six historic structure properties listed in Table 3; see Table 1 for corresponding field numbers and key to figure locations.

Table 3. Tier II FEIS versus Refined Alignment APE NRHP-Eligible Resources.

NRHP Eligible Resource	Tier II FEIS APE	RA APE	Field No.	Figure
Site 45PI488	✓	✓	-	B.8
27-4114	✓	Ø	-	-
27-4125	✓	Ø	-	-
27-4154	✓	Ø	-	-
27-4160	✓	Ø	-	-
6020 8th Street E	Ø	✓	11	B.6
411 Birch Street	Ø	✓	19	B.10
4403 Freeman Road E	Ø	✓	22	B.19
6007 Milwaukee Avenue E	Ø	✓	37	B.27
6020 Milwaukee Avenue E	Ø	✓	40	B.27
860 64th Avenue	Ø	✓	42	B.6

✓=within APE; Ø=outside APE

Existing RA cultural resources information is sufficient for NEPA Re-Evaluation as completion of survey and shovel testing is not likely to change the kind of resources present; however, there is a small chance of identifying additional archaeological resources. To complete RA cultural resources investigations we recommend the following prior to construction and ground disturbing activity:

- Complete survey of 14.4 acres (see Table 2);
- Complete excavation of 281 shovel tests (see Table 2);
- Develop a plan for deeply buried resource discovery as a component of the geotechnical investigation; and,
- Develop mitigation measures for affected NRHP eligible properties (see Table 3).

References

Anderson, W.W., A.O. Ness, and A.C. Anderson
1955 *Soil Survey of Pierce County, Washington*. Series 1939, No. 27. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station and the Washington State Planning Council.

Ballard, Arthur C.
1929 *Mythology of Southern Puget Sound*. University of Washington Press, Seattle.

Berger, Margaret
2014a *Cultural Resources Assessment for the Suncap Freeman Road Project, Fife, Pierce County, Washington.* Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

2014b *Cultural Resources Assessment for the Valley Avenue Bridge Repair, Puyallup, Pierce Country, Washington.* Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Berger, Margaret, Susan Medville, and Jennifer Chambers
2008 *Cultural Resource Assessment for the Blair-Hylebos Redevelopment Project, Tacoma, Pierce Country, Washington*. Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Bonney, W.P.
1927 *History of Pierce County, Washington, Volume I.* Pioneer Historical Publishing Company, Chicago.

Boxberger, Daniel L.
1984 The Introduction of Horses to the Southern Puget Sound Salish. In *Western Washington Indian Socio-Economics: Papers in Honor of Angelo Anastasio*, edited by Herbert C. Taylor, Jr., and Garland F. Grabert, pp. 103-119. Western Washington University, Bellingham.

Carlson, Roy
1990 Cultural Antecedents. In *Northwest*, edited by Wayne Suttles, pp. 60-69. Handbook of the North American Indians, Volume 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Cheever, Bruce Bissell
1949 The Development of Railroads in the State of Washington, 1860 to 1948. Unpublished Master's thesis, Western Washington College of Education, Bellingham.

Cooper, Jason
2008 *Cultural Resource Assessment for the Freeman Road Property and Inner Hylebos Property, Pierce County, Washington.* Short Report No. 4. AMEC Earth and Environmental, Bothell.

Cowan, Jason, and Marcia Montgomery
2011 *Cultural Resources Assessment for the Stowe Construction Warehouse Development on Wapato Creek, Fife, Washington.* Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Curtis, Edward S.
1913 *The North American Indian Volume 9.* The Plimpton Press, Norwood, Massachusetts.

Davis, Ellis A.
1909 *Davis' New Commercial Encyclopedia: Washington, Oregon and Idaho, the Pacific Northwest*. Ellis A. Davis, Berkeley.

Diedrich, Melanie
2012 *Archaeological Monitoring for Parcel 14, the East-West Road and Alexander Avenue, Tacoma, Pierce County, Washington.* Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Dragovich, Joe E., Patrick T. Cringle, and Timothy J. Walsh
1994 Extent and Geometry of the Mid-Holocene Osceola Mudflow in the Puget Lowland -- Implications for Holocene Sedimentation and Paleogeography. *Washington Geology* 22(3):3-26.

Earley, Amber
2008 *Cultural Resources NEPA Re-evaluation for the 70th Avenue East and Valley Avenue East Project, Fife, Washington.* Report No. WA-08-002. Northwest Archaeological Associates, Seattle.

Evans, Elwood, editor
1889 *History of the Pacific Northwest: Oregon and Washington, Volume 1*. North Pacific History Company, Portland.

Ferland, Sarah
2010 *Cultural Resources NEPA Re-evaluation for the 70th Avenue East and Valley Avenue East Project, Fife, Washington.* Report No. WA101-015. Northwest Archaeological Associates, Seattle.

Franklin, Jerry F., and C.T. Dryness
1973 *Natural Vegetation of Oregon and Washington*. U.S. Forest Service General Technical Report PAW-8, Portland.

Gallacci, Caroline
1982 Survey-inventory forms for the Pierce County Cultural Resource Survey. On File, Department of Archaeology and Historic Preservation, Olympia.

Garris, Mark
1995 *A Sample Survey and Predictive Model for Historic Properties Associated with Transportation in Washington State*. Eastern Washington University Reports in Archaeology and History 100-91. Archaeological and Historical Services, Cheney.

General Land Office (GLO)
1864a Cadastral Survey Plat, T20N, R4E. On file, U.S. Bureau of Land Management, Spokane.

1864b Cadastral Survey Notes, T20N, R4E. On file, U.S. Bureau of Land Management, Spokane.

Gibbs, George
1967 *Indian Tribes of Washington Territory*. Ye Galleon Press, Fairfield.

Harrison, Jonathan B.
1887 *The Latest Studies on Indian Reservations*. Indian Rights Association, Philadelphia.

Hawthorne, Julian, editor
1893 *History of Washington; The Evergreen State from Early Dawn to Daylight*, Volume 2. American Historical Publishing Company, New York.

Heritage League of Pierce County
1990 *A History of Pierce County, Washington*. Heritage League of Pierce County, Tacoma.

Hilton, George W., and John F. Due
1964 *The Electric Interurban Railways in America*. Stanford University Press, Stanford, California.

Holstine, Craig, and Joan M. Robinson
1992 *A Cultural Resources Addendum to Washington State Department of Transportation's SR 167: SR 509 to SR 161 Corridor Adoption Project, Pierce County, Washington*. Short Report DOT92-65. Archaeological and Historical Services, Eastern Washington University, Cheney.

Kiers, Roger, and Craig Holstine
2012 *State Route 167 Puyallup River/Meridian Street Bridge Phase, SR 167 Extension – Puyallup to SR 509 Freeway Construction Project, Pierce County, Washington.* Cultural Resources Program Report No. 12-10. Washington State Department of Transportation, Tumwater.

Landis, Robert L.
1969 *Post Offices of Oregon, Washington and Idaho*. Patrick Press, Portland.

Lentz, Florence K.
1995 *An Inventory and Evaluation of Historic Properties Associated with Transportation in Washington State*. Eastern Washington University Reports in Archaeology and History 100-90. Archaeological and Historical Services, Cheney.

Leopold, Estrella B., and Robert Boyd
1999 An Ecological History of Old Prairie Areas in Southwestern Washington. In *Indians, Fire and the Land in the Pacific Northwest*, edited by Robert Boyd, pp. 139-163. Oregon State University Press, Corvallis.

Luttrell, Charles T.
1992a The Firwood School Gymnasium Determination of Eligibility to the National Register of Historic Places. On file, Department of Archaeology and Historic Preservation, Olympia.

1992b The Golden Rule Motel Determination of Eligibility to the National Register of Historic Places. On file, Department of Archaeology and Historic Preservation, Olympia.

1992c The George Hoertrich Electrical Shop Determination of Eligibility to the National Register of Historic Places. On file, Department of Archaeology and Historic Preservation, Olympia.

2001 *Cultural Resource Investigations for the Washington State Department of Transportation's SR 167: Puyallup to SR 509 Project, Pierce County, Washington.* Short Report DOT01-14, revised 2005. Archaeological and Historical Services, Eastern Washington University, Cheney.

Meany, Edmond S.
1923 *Origin of Washington Geographic Names*. University of Washington Press, Seattle.

Robinson, Joan M.
1984 *An Archaeological Reconnaissance of SR 167: SR 161 to 6th Avenue North, King and Pierce Counties, Washington (TAD 318).* Short Report DOT84-76. Archaeological and Historical Services, Eastern Washington University, Cheney.

1886 *A Cultural Resource Survey of the City of Fife 54th Avenue East Widening Project, Pierce County, Washington.* Short Report DOT86-4. Archaeological and Historical Services, Eastern Washington University, Cheney.

1990 *A Cultural Resources Records Review of the I-5 Corridor, Pierce County, Washington.* Short Report DOT90-29. Archaeological and Historical Services, Eastern Washington University, Cheney.

Robinson, Joan M.
1991 *A Cultural Resources Overview of the SR 167 New Alignment Corridor, Pierce County, Washington*. Short Report DOT91-21. Archaeological and Historical Services, Eastern Washington University, Cheney.

1992 *A Cultural Resources of Alternatives 1, 2, & 3 of the Washington State Department of Transportation's Proposed New Alignment of SR 167, Pierce County, Washington*. Short Report DOT92-30. Archaeological and Historical Services, Eastern Washington University, Cheney.

1999 Cultural, Historic, and Archaeological Resources. In *Tier I Final Environmental Impact Statement, SR 167 Corridor Adoption, Puyallup to SR 509, Pierce County, Washington*. Federal Highway Administration, Olympia, and Washington State Department of Transportation, Tumwater.

Smith, Marian W.
1940 *The Puyallup-Nisqually*. Columbia University Press, New York.

1941 The Coast Salish of Puget Sound. *American Anthropologist* 43(2):197-211.

1963 The Puyallup in Washington. In *Acculturation in Seven American Indian Tribes*, edited by Ralph Linton, pp. 3-36. Peter Smith, Glouster, Massachusetts.

Snell, Bertha K.
1907 Tacoma's Tributary Country. *The Coast* 14(2):89-92.

Suttles, Wayne, and Barbara Lane
1990 Southern Coast Salish. In *Northwest*, edited by Wayne Suttles, pp. 485-502. Handbook of the North American Indians, Volume 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

The Tacoma Daily Ledger
1929 "Farmers Earn From $200 to $1,000 an Acre." April 9, 1929:Section 3:1:1.

1941 "Thriving Fife Community Now 'City-Within-a-City' With Opening of Vraves' Store." November 21, 1941:9:1.

The Tacoma News Tribune
1929 "Fife-Gardenville: A Community of Golden Opportunity." October 30, 1929:21:1.

Thorson, Robert M.
1980 Ice-Sheet Glaciation of the Puget Lowland, Washington, During the Vashon Stade (Late Pleistocene). *Quaternary Research* 13(3):303-321.

The West Shore
1887a "Tacoma Improvements." *The West Shore* 13(8):639.

1887b "Tacoma Statistics for 1886." *The West Shore* 13(1):92.

U.S. Geological Survey
1898 Tacoma, Washington, 15' Quadrangle. U.S. Government Printing Office, Washington, D.C.

U.S. Senate, Select Committee on Indian Affairs
1989 Hearing Before the Select Committee on Indian Affairs, United States Senate, One Hundred First Congress, First Session on S. 402, February 24, 1989. Settlement of Land Claims of Puyallup Tribe of Indians in the State of Washington. U.S. Government Printing Office, Washington, D.C.

Washington Independent
1876 "The Territories." September 7, 1876:2:4.

Washington State World's Fair Commission
1893 *The State of Washington*. Washington State World's Fair Commission, Olympia.

Waterman, Thomas T.
1920 [Puget Sound Geography]. Manuscript (Ms.) 1864, Smithsonian Office of Anthropology, Bureau of American Ethnology Manuscript Collection. Microfilm on file, Suzzallo Library, University of Washington, Seattle.

Wesson, Gary C., and M. Leland Stilson
1987 *Resource Protection Planning Process: Southern Puget Sound Study Unit*. An RP3 document prepared for the Washington State Department of Community Development, Office of Archaeology and Historic Preservation, Olympia.

Zulauf, Allen S.
1979 *Soil Survey of Pierce County Area, Washington*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station.

Appendix A

USGS Quadrangle Project APE Maps

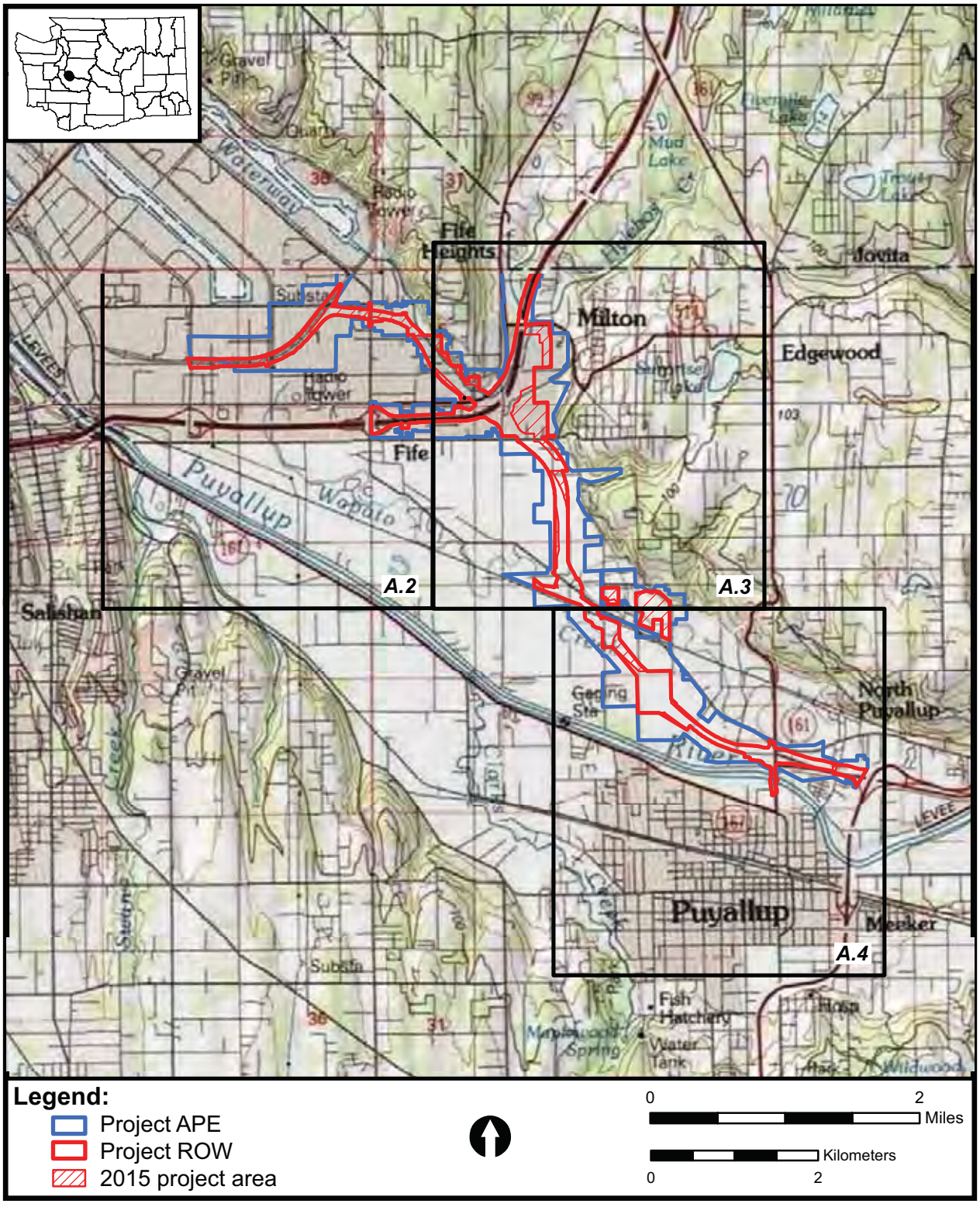


Figure A.1. *Appendix A key showing the SR 167 Extension Project APE and the locations of figures A.2 through A.4 (adapted from USGS 7.5' topographic quadrangles Tacoma North, Tacoma South, Poverty Bay, and Puyallup, Wash.).*

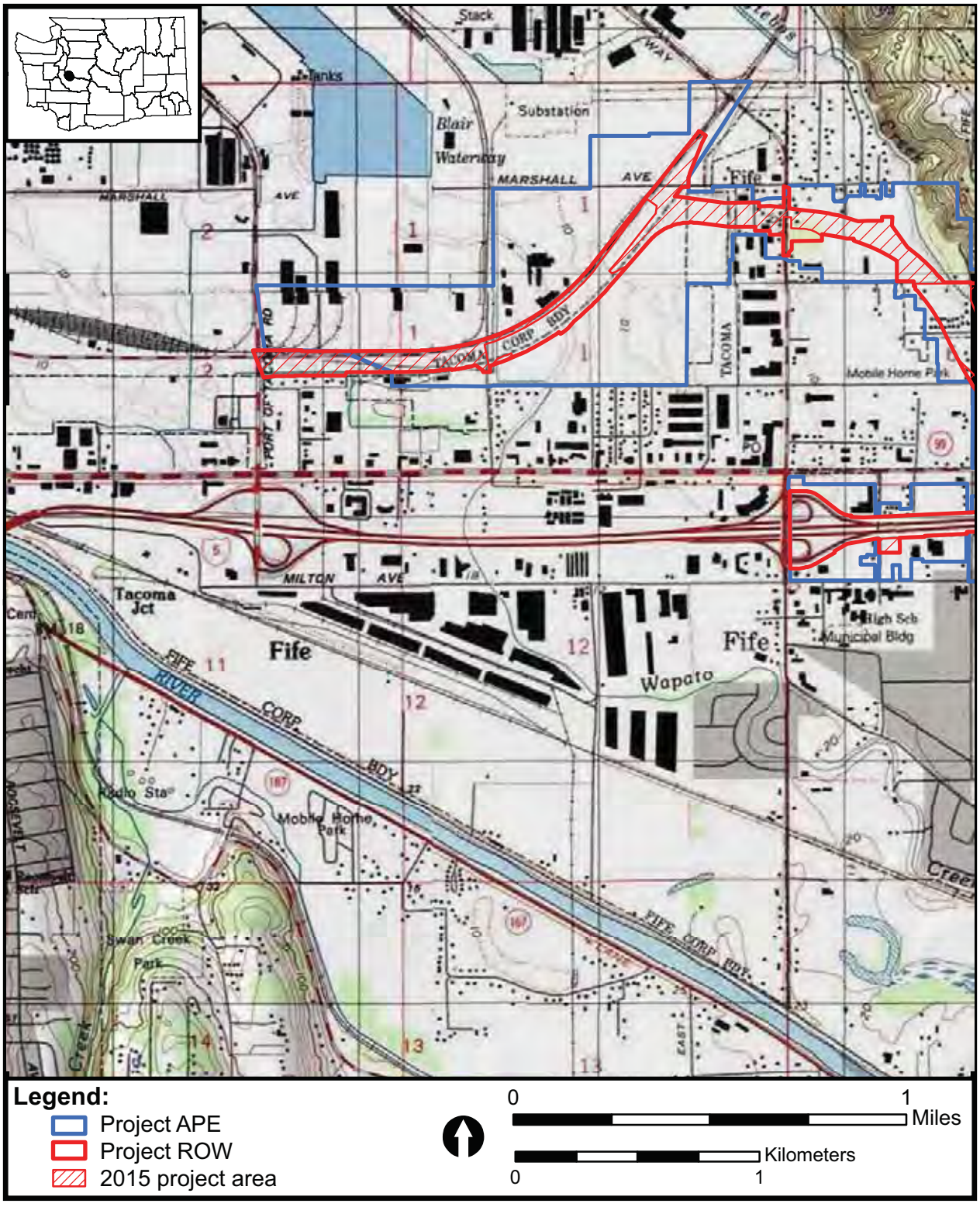


Figure A.2. *Map showing the west end of the SR 167 Extension Project APE (adapted from USGS 7.5' topographic quadrangles Tacoma North, Tacoma South, Poverty Bay, and Puyallup, Wash., 1997, 1:24,000).*

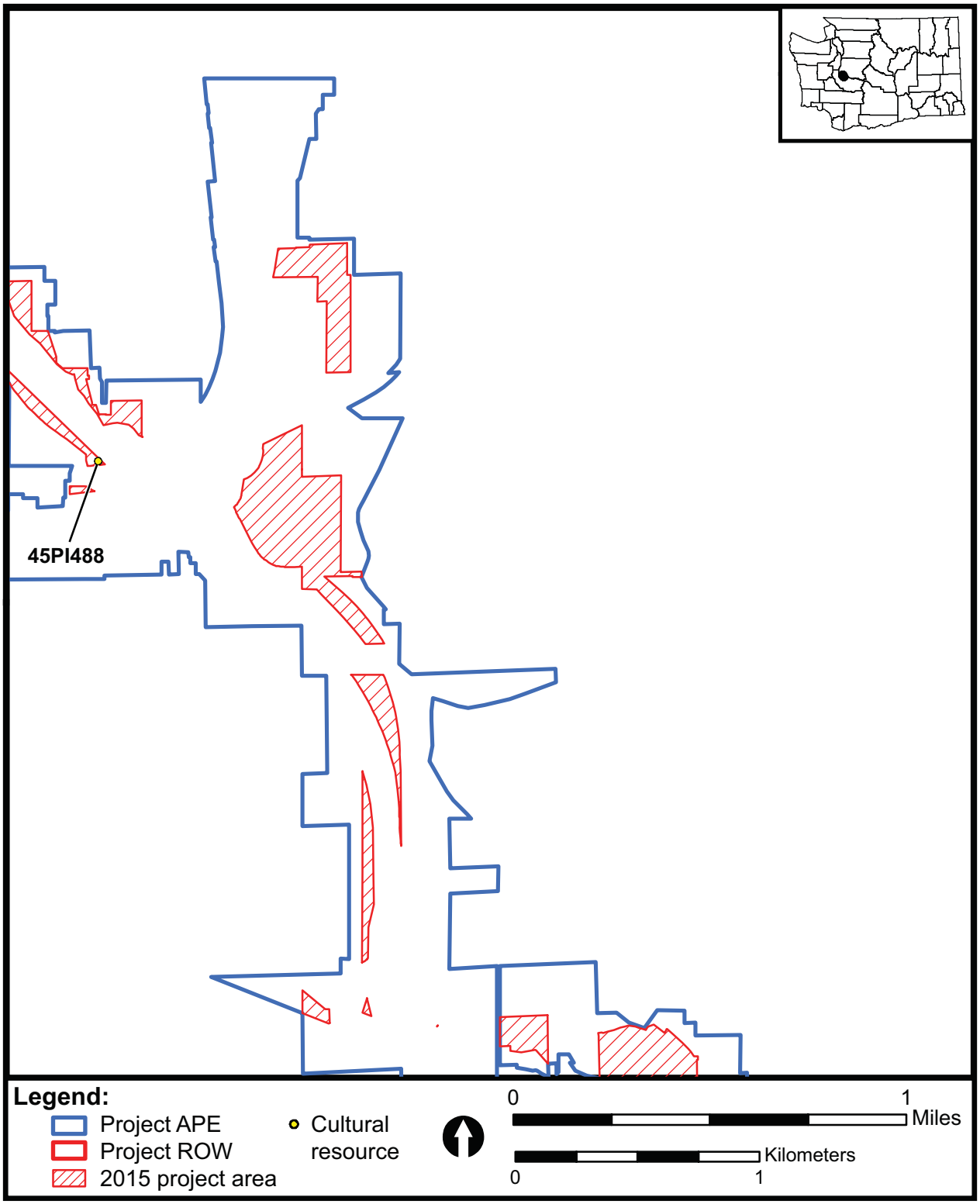


Figure A.3. *Map showing the central portion of the SR 167 Extension Project APE and the location of prehistoric site 45PI488 (adapted from USGS 7.5' topographic quadrangles Poverty Bay and Puyallup, Wash., 1997, 1:24,000).*

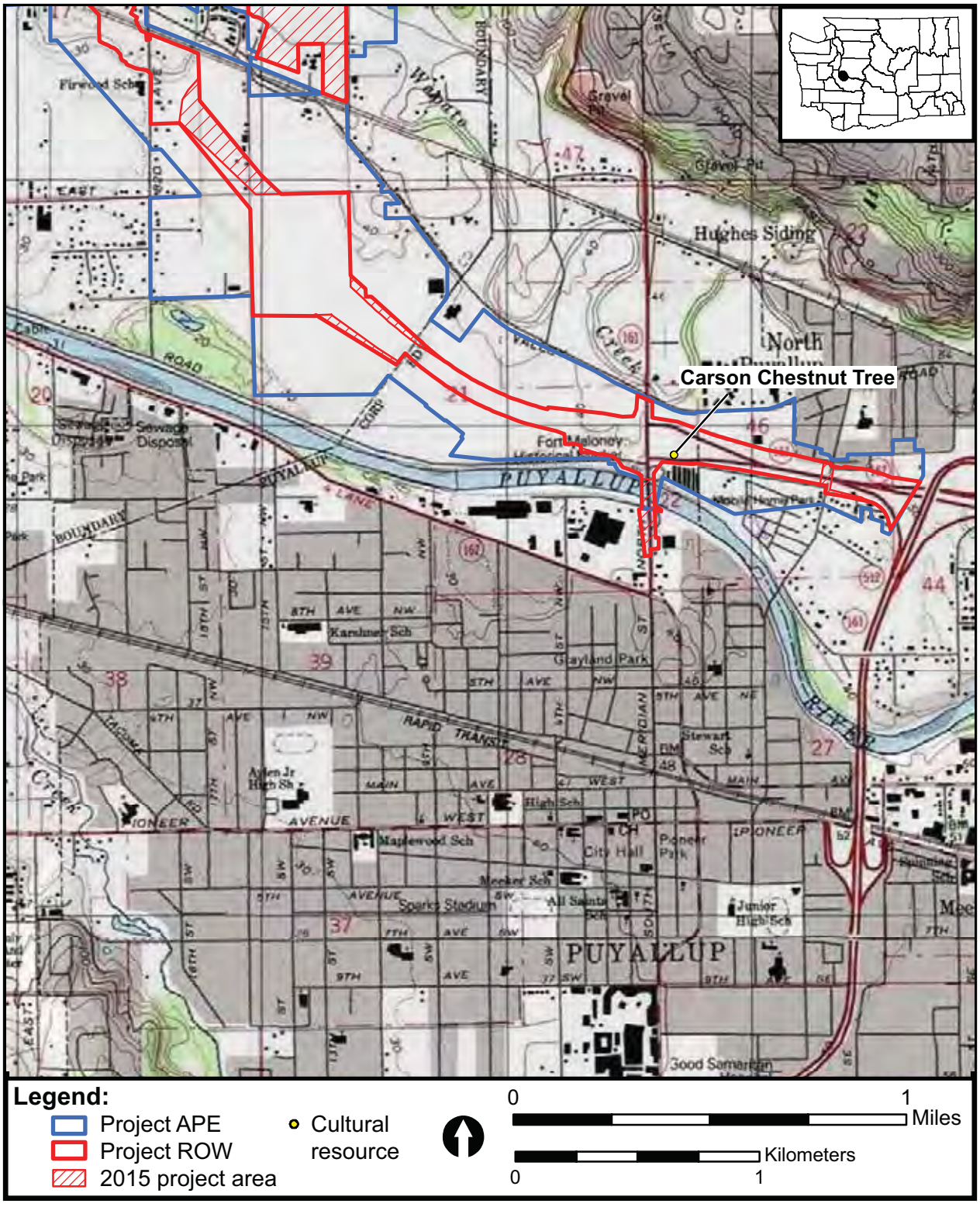


Figure A.4. *Map showing the east end of the SR 167 Extension Project APE and the location of the Carson Chestnut Tree (adapted from USGS 7.5' topographic quadrangle Puyallup, Wash., 1997, 1:24,000).*

Appendix B

Aerial Project APE Maps

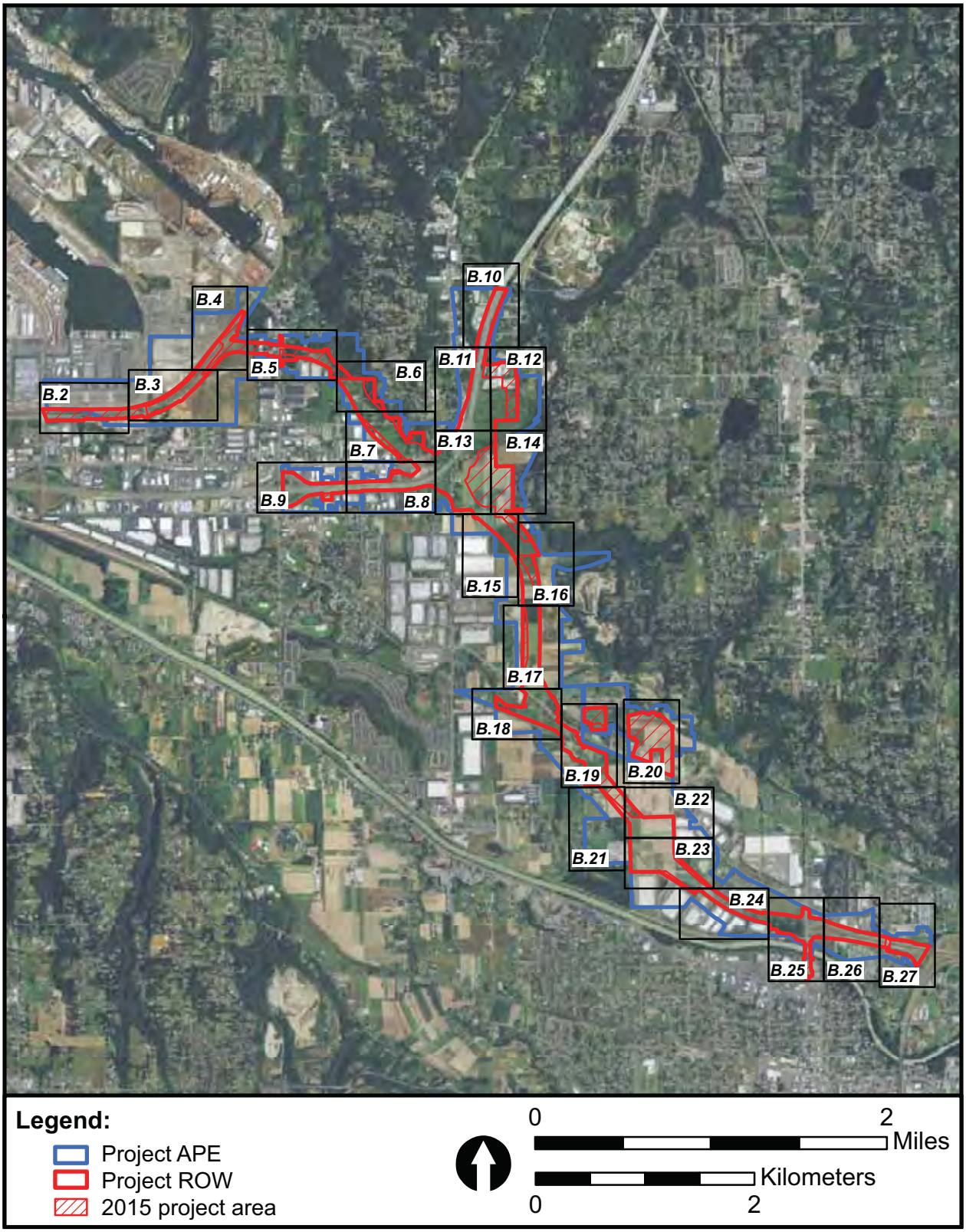
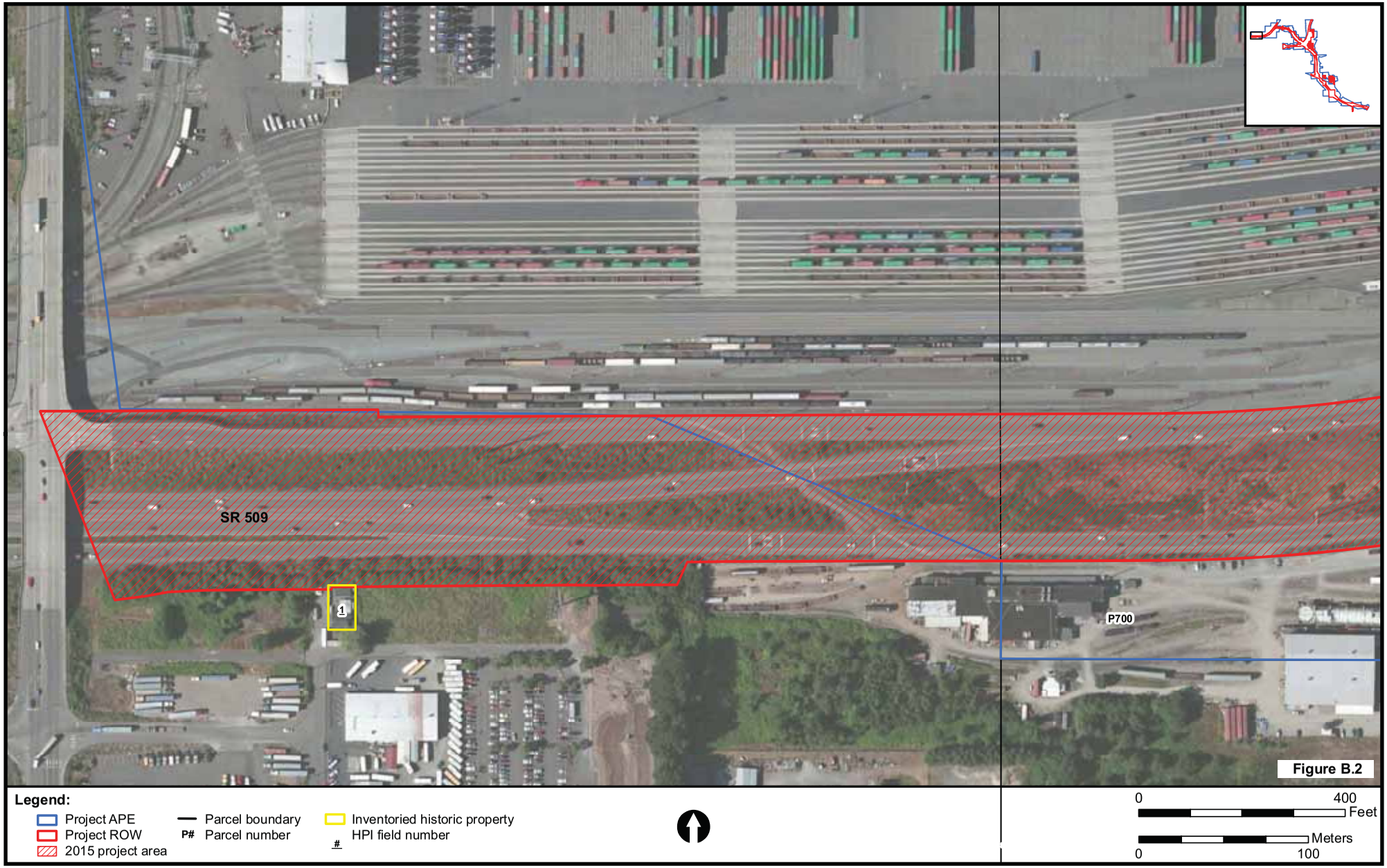
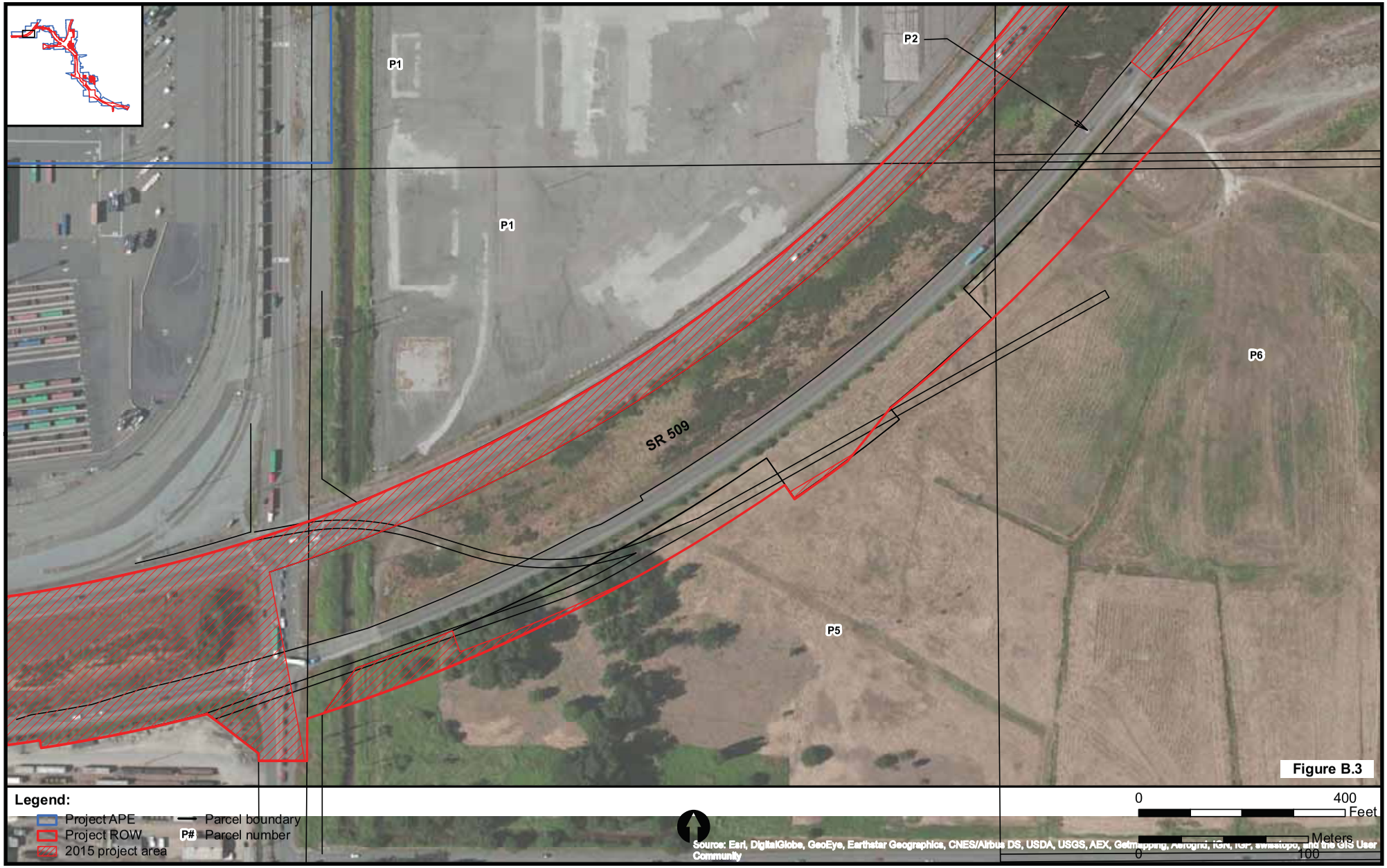


Figure B.1. *Appendix B key showing the project APE, the project ROW, the 2015 project area, and the locations of figures B.2 through B.26.*


SR 509
1
P700
Figure B.2
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
Meters
0
100


P1
P2
P1
P6
SR 509
P5
Figure B.3
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
0
400
Feet
Meters
0
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


SR 509
P400
P9
P8
P2
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
0
400
Feet
Meters
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.4

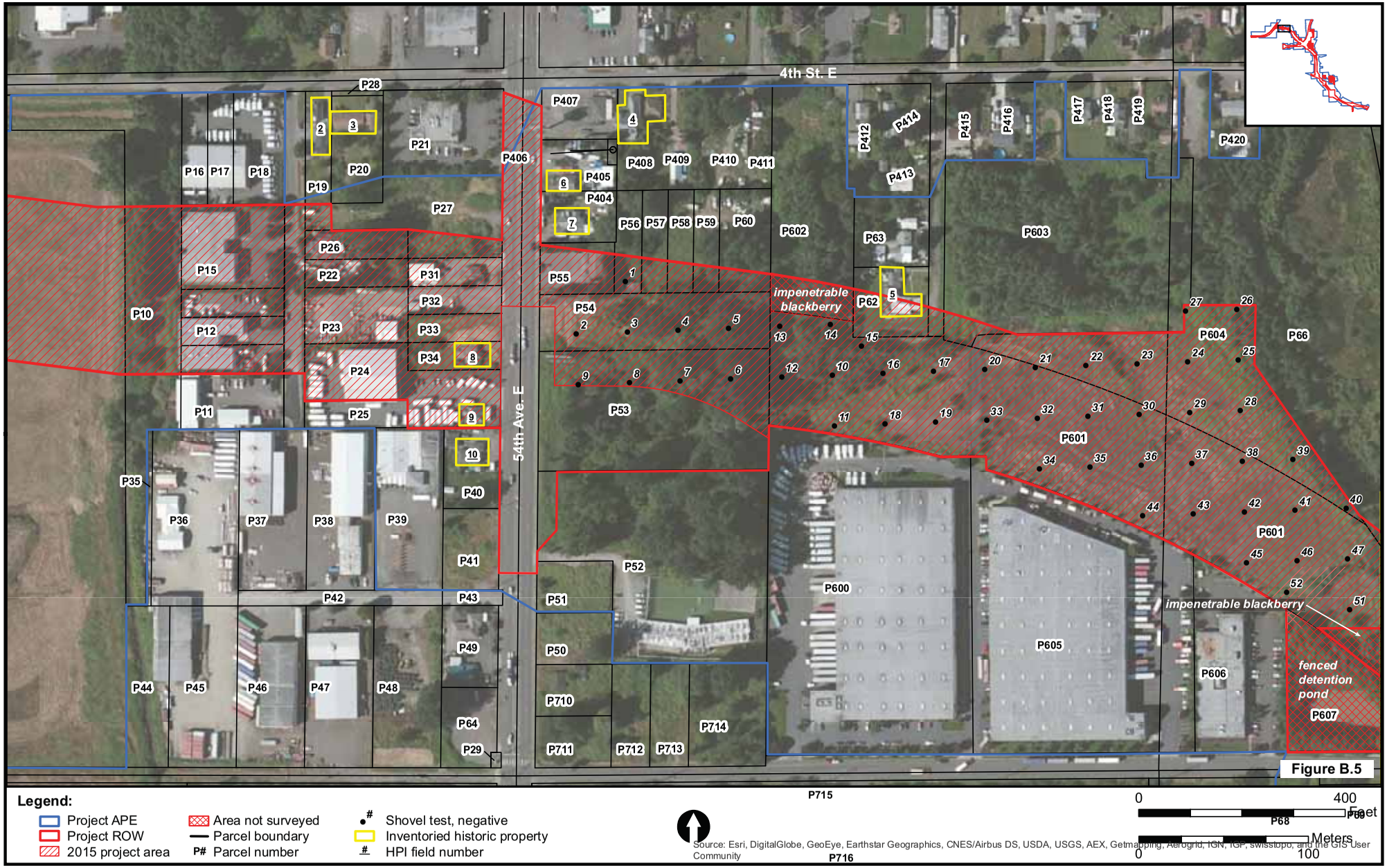


Figure B.5

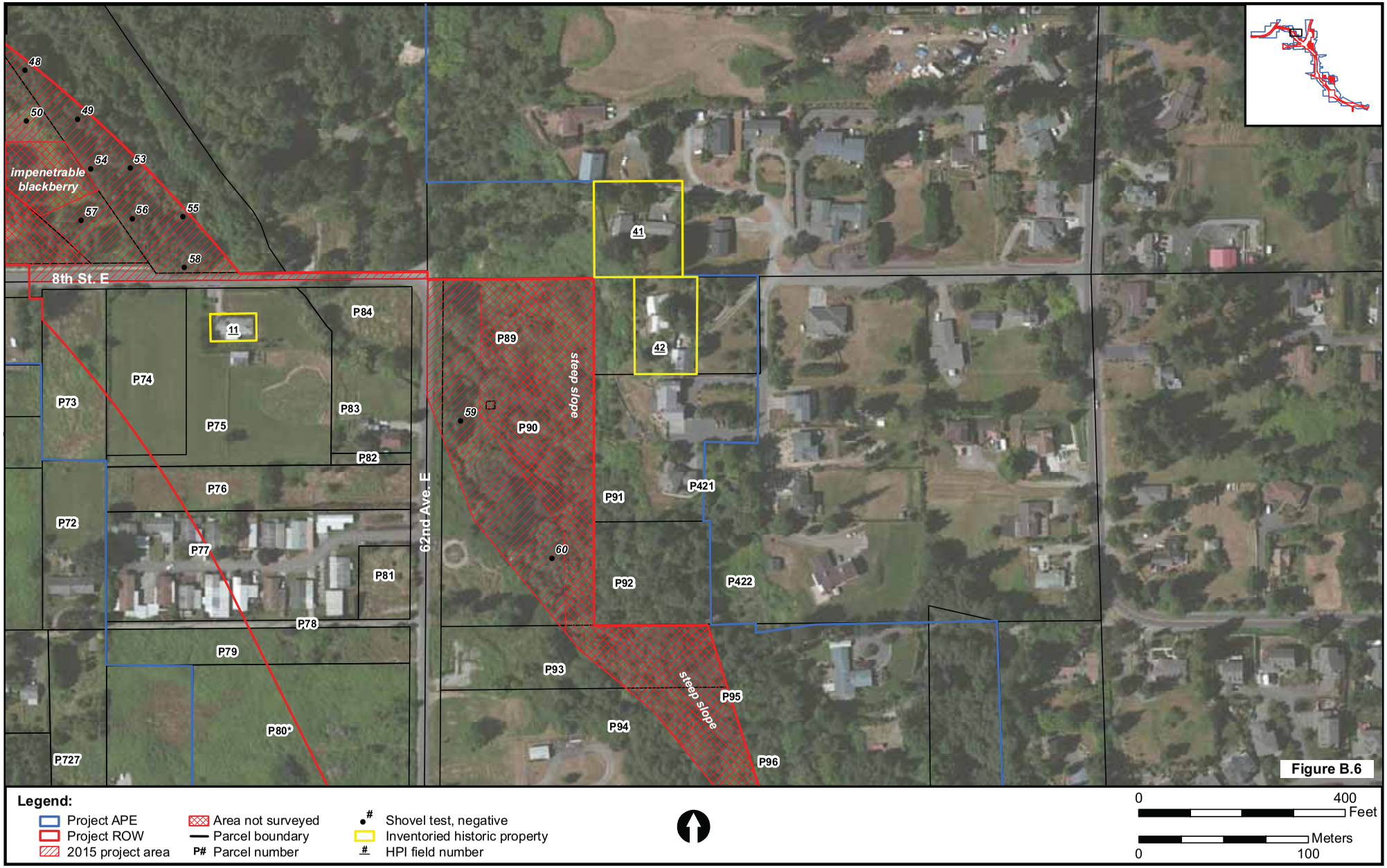
Legend:

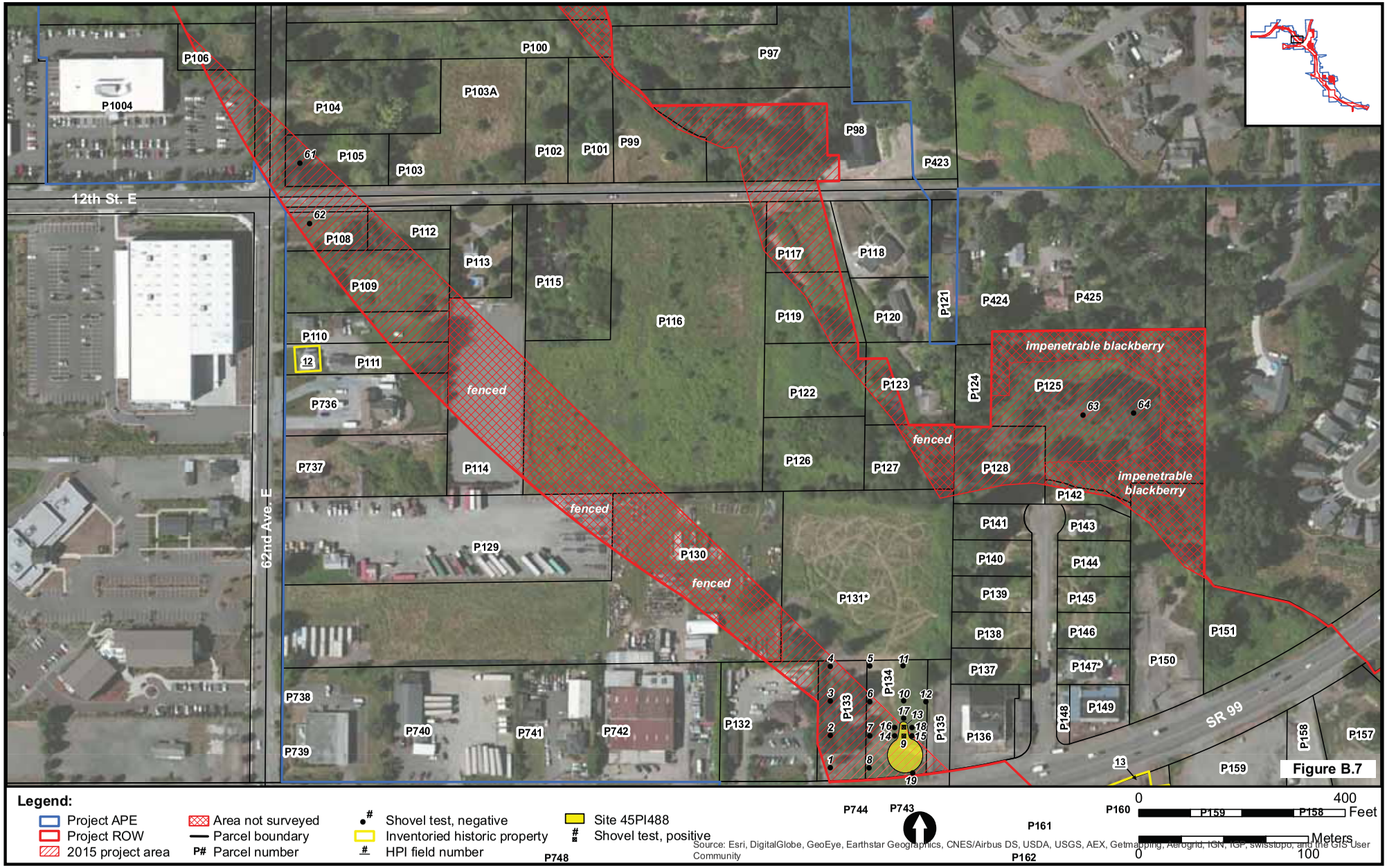
- Project APE
- Project ROW
- 2015 project area
- Area not surveyed
- Parcel boundary
- P# Parcel number
- Shovel test, negative
- Inventoried historic property
- # HPI field number

0 400 Feet

0 100 Meters

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


48
50
49
54
53
impenetrable blackberry
57
56
55
58
8th St. E
11
P84
P74
P73
P75
P83
P82
P76
P72
P77
P81
P78
P79
P80*
P727
62nd Ave. E
41
42
P89
steep slope
59
P90
P91
P421
60
P92
P422
P93
steep slope
P95
P94
P96
Figure B.6
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
0
400
Feet
Meters
0
100


P106
P1004
P100
P97
P104
P103A
P98
61
P105
P102
P101
P99
P423
P103
12th St. E
62
P108
P112
P117
P118
P113
P115
P109
P116
P119
P120
P121
P424
P425
P110
12
P111
fenced
P123
P124
P125
impenetrable blackberry
63
64
P736
P122
fenced
P737
P114
P126
P127
P128
impenetrable blackberry
P142
62nd Ave. E
fenced
P141
P143
P129
P130
P140
P144
fenced
P139
P131*
P145
P138
P146
P151
P137
P147*
P150
P738
P134
P133
P148
P149
SR 99
P740
P741
P742
P132
P135
P136
P158
P157
P739
P159
13
Figure B.7
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
Site 45PI488
Shovel test, positive
P744
P743
P160
P161
P748
P162
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

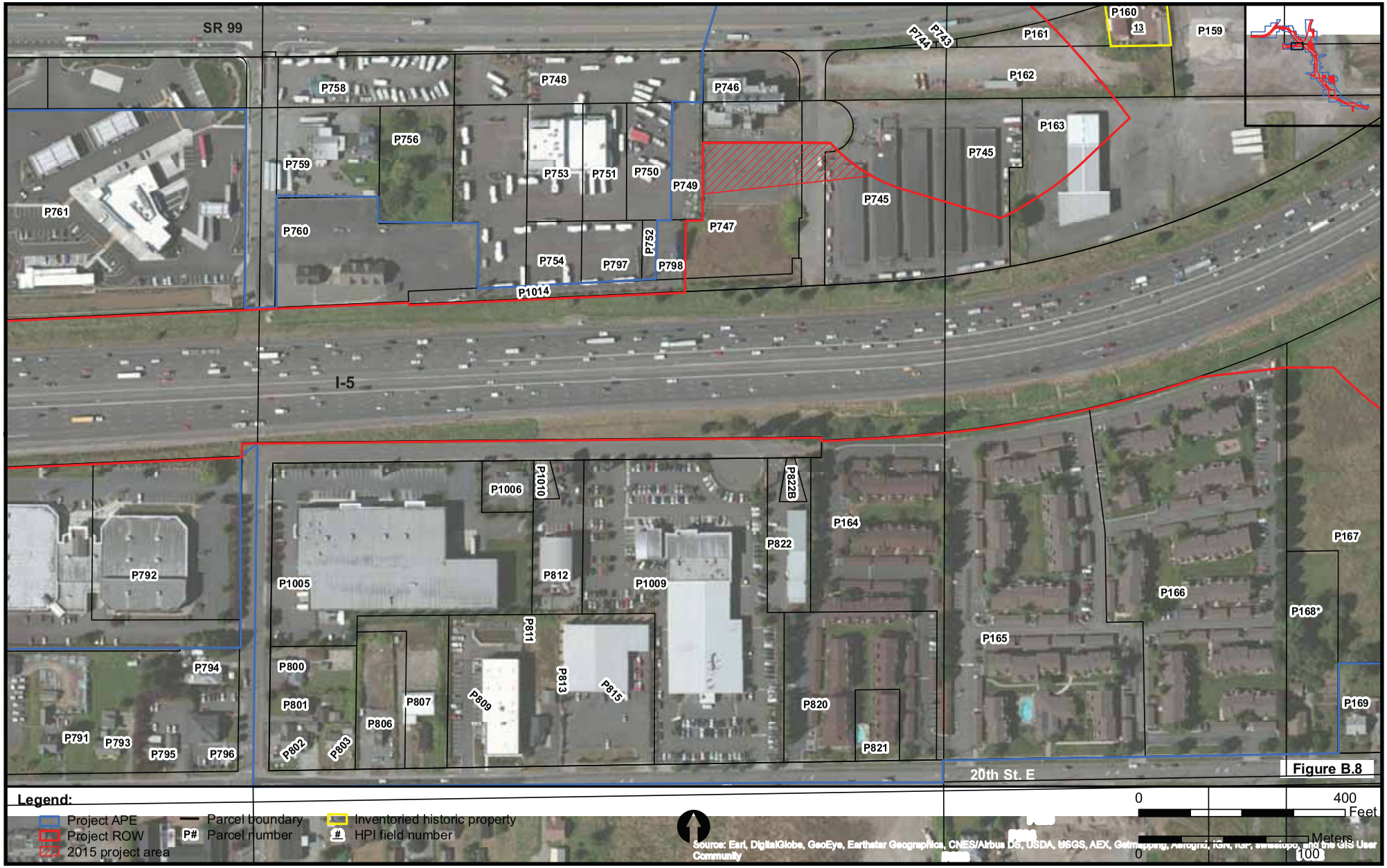
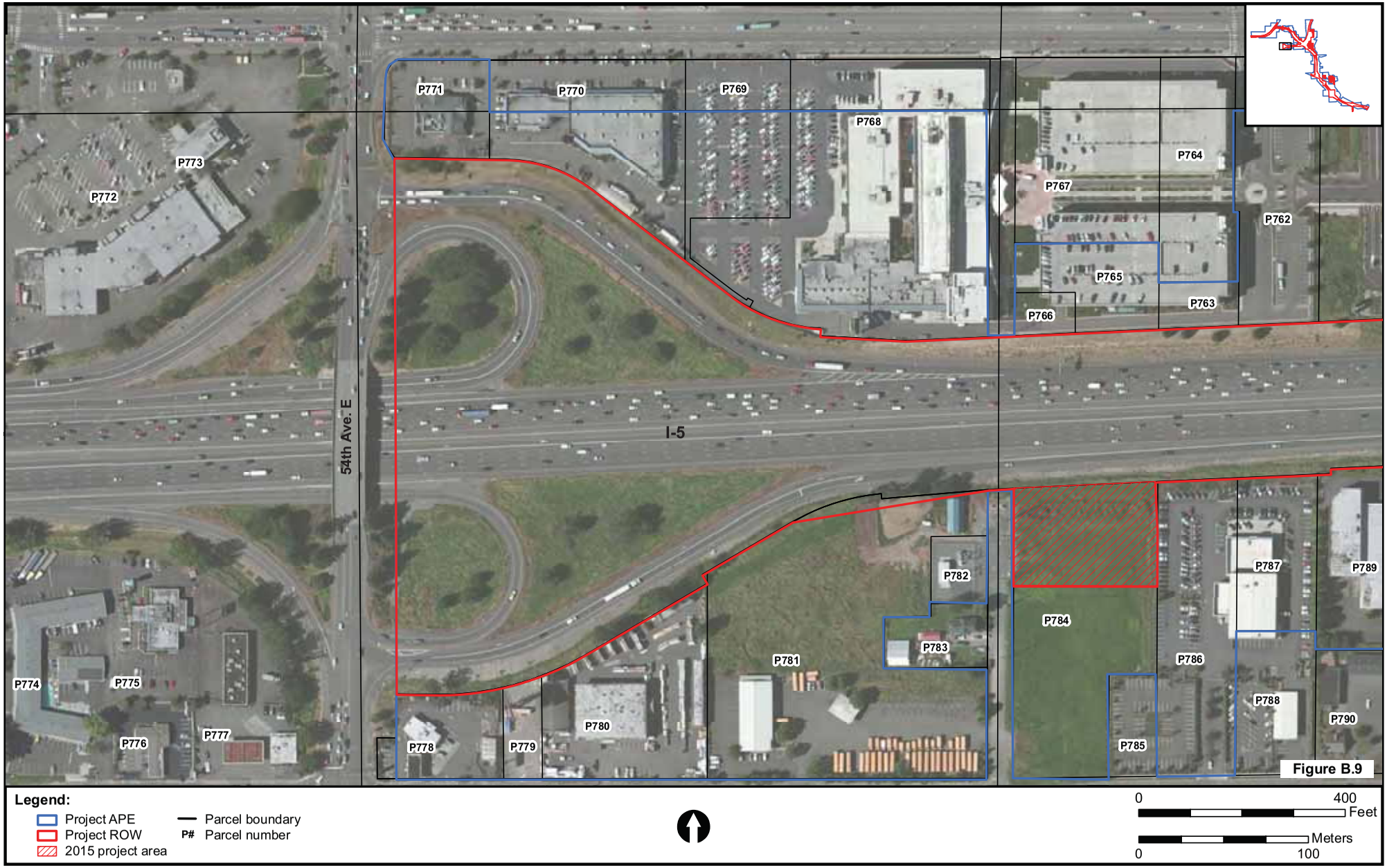

SR 99
I-5
20th St. E
P758
P748
P746
P744
P743
P161
P160
13
P159
P162
P163
P745
P756
P759
P753
P751
P750
P749
P747
P761
P760
P752
P754
P797
P798
P1014
P1010
P1006
P822B
P164
P822
P167
P792
P1005
P812
P1009
P166
P168*
P811
P165
P794
P800
P801
P807
P809
P813
P815
P820
P169
P806
P791
P793
P795
P796
P802
P803
P821
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.8


P771
P770
P769
P768
P764
P767
P762
P773
P772
P765
P763
P766
54th Ave. E
I-5
P782
P787
P789
P784
P783
P781
P786
P774
P775
P788
P790
P780
P777
P776
P778
P779
P785
Figure B.9
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
0
400
Feet
Meters
0
100


P448
P450
P449
P451
P452
P453
20
P454
19
P455
P454
P447
P446
P456
P445
I-5
P572
P457
18
P444
P459
P460
P458
P441
P443
P461
17
P440
P462
Legend:
Project APE
Project ROW
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
Meters
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.10


P462
P441
P440
P463
P442
P438
P439
P464
P437
P465
P436
I-5
P435
P466
P434
P468
P433
P467
P432
P431
SR 99
P430
P429
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
0
400
Feet
Meters
0
100

Figure B.11

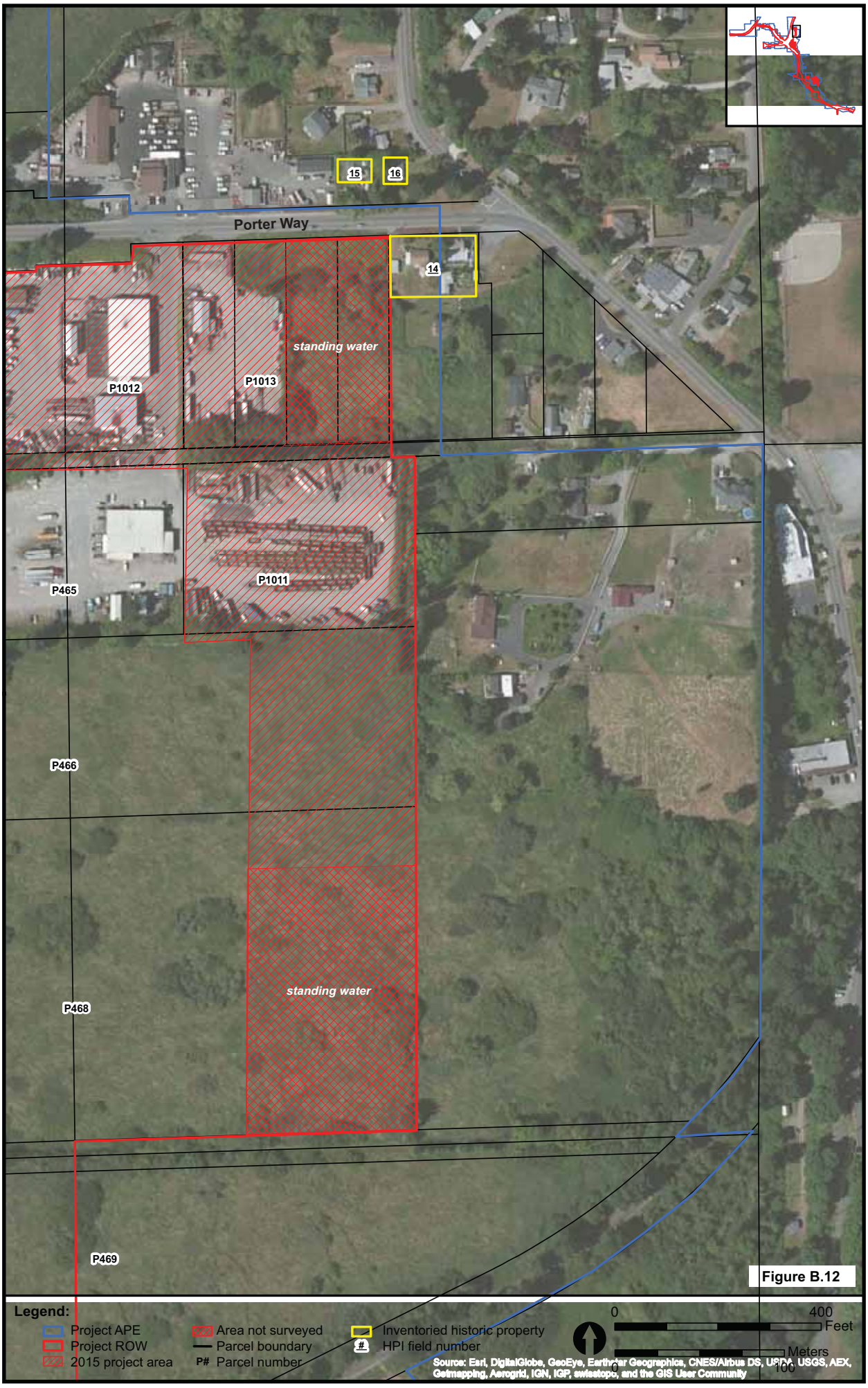
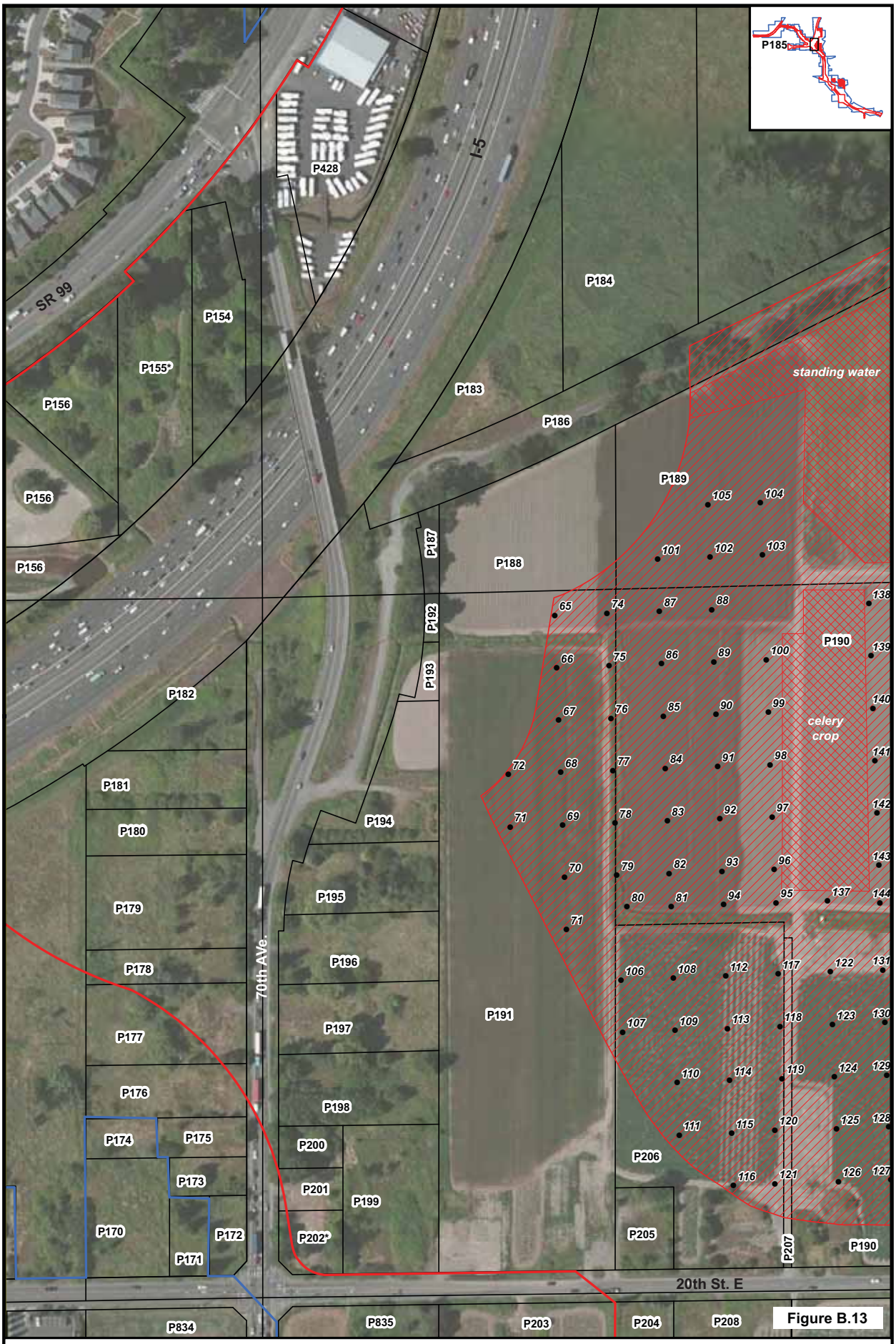
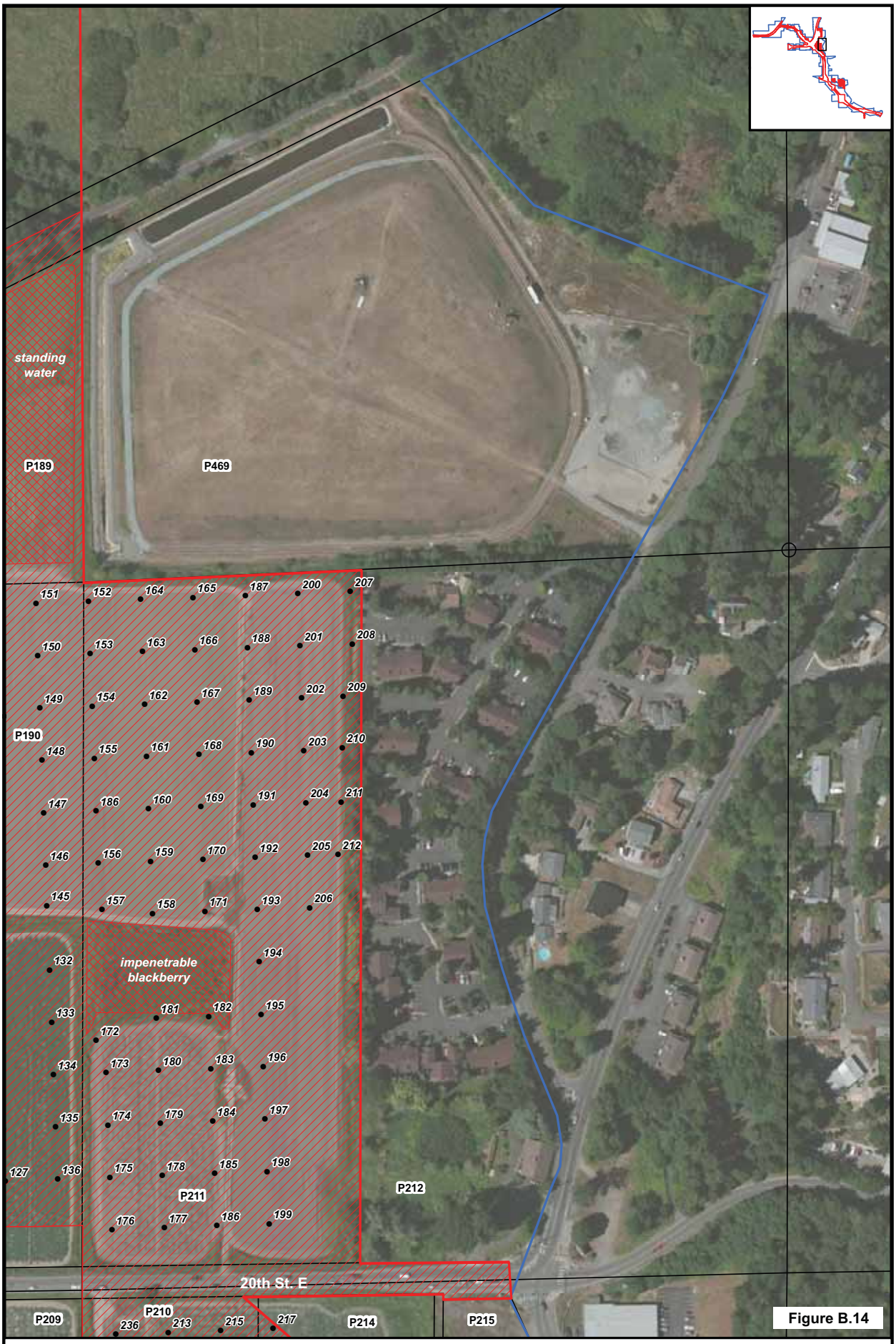

Porter Way
15
16
14
standing water
P1012
P1013
P1011
P465
P466
P468
standing water
P469
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

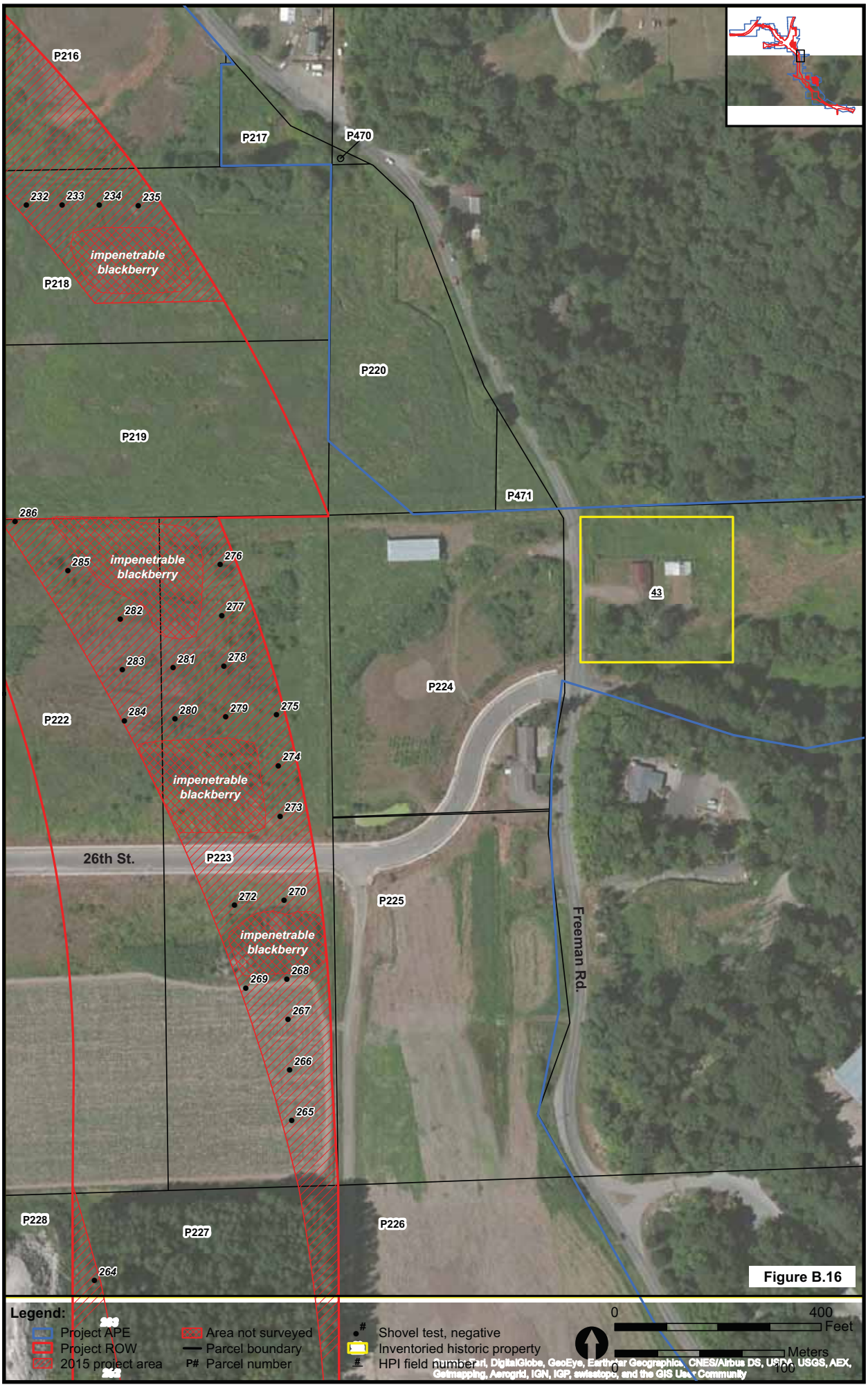
Figure B.12


P185
P428
I-5
SR 99
P154
P155*
P156
P183
P184
P186
standing water
P189
P188
P187
P192
P193
P182
P190
celery crop
P181
P180
P194
P179
P195
P178
P196
70th AVe.
P191
P177
P197
P176
P198
P174
P175
P200
P173
P201
P199
P170
P172
P202*
P171
P206
P205
P207
20th St. E
P834
P835
P203
P204
P208
Figure B.13
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
0
400
Feet
Meters
0
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


standing water
P189
P469
P190
impenetrable blackberry
P211
P212
20th St. E
P209
P210
P214
P215
151 152 164 165 187 200 207
150 153 163 166 188 201 208
149 154 162 167 189 202 209
148 155 161 168 190 203 210
147 186 160 169 191 204 211
146 156 159 170 192 205 212
145 157 158 171 193 206
132 194
133 181 182 195
172
134 173 180 183 196
135 174 179 184 197
127 136 175 178 185 198
176 177 186 199
236 213 215 217
Figure B.14
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
0 400 Feet
0 100 Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


P204
P209
P208
P210
P203
214
216
218
220
219
221
224
222
225
228
223
226
229
227
230
231
P214
P213
"A"
P839
P221
26th St.
P848
Legend:
Project APE
Project ROW
2015 project area
Shovel test, negative
Parcel boundary
P# Parcel number
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.15


P216
P217
P470
232
233
234
235
impenetrable blackberry
P218
P220
P219
P471
286
285
impenetrable blackberry
276
277
282
283
281
278
43
P224
284
280
279
275
P222
274
impenetrable blackberry
273
26th St.
P223
272
270
P225
Freeman Rd.
impenetrable blackberry
269
268
267
266
265
P228
P227
P226
264
Figure B.16
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
0
400
Feet
Meters
100
Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

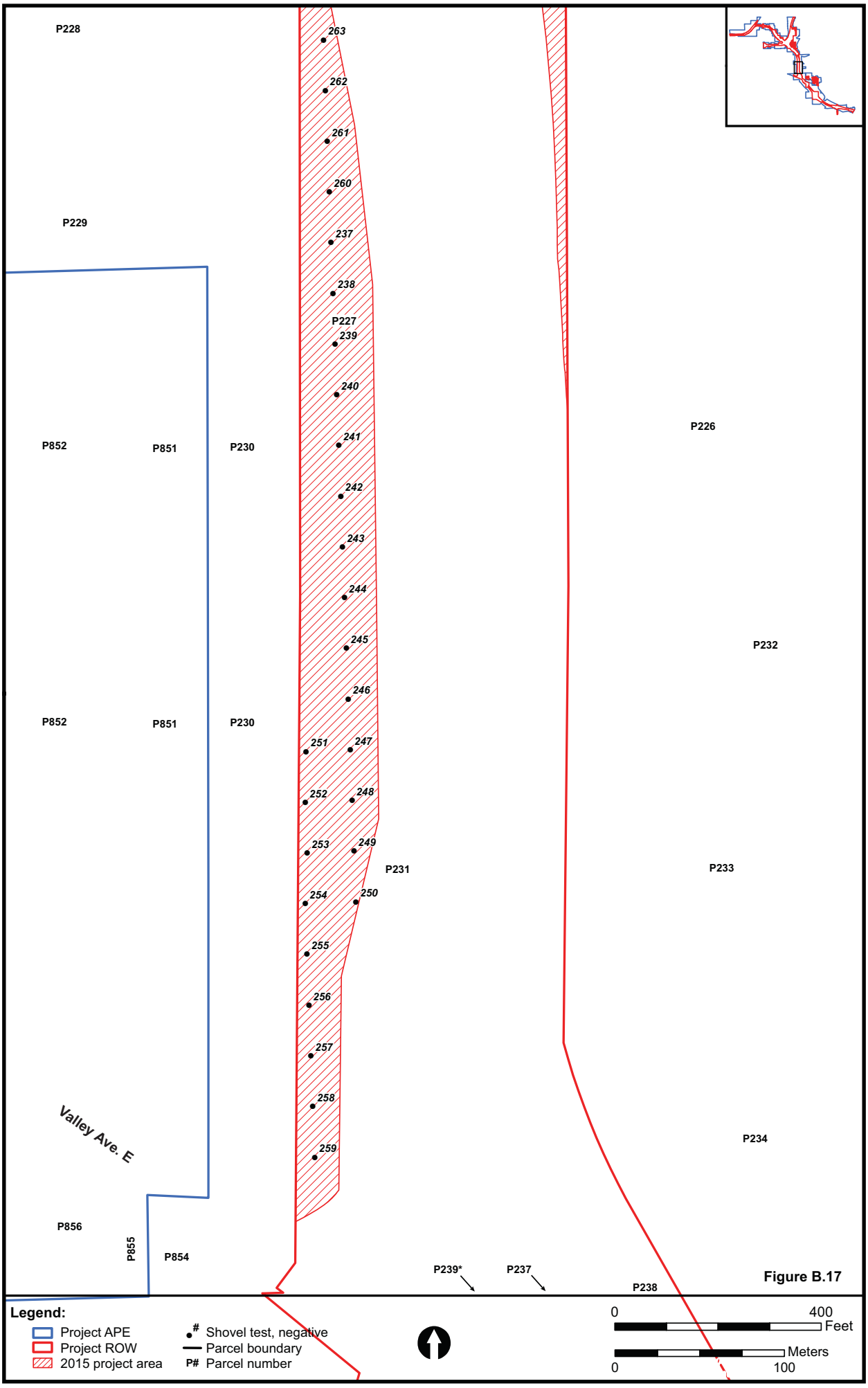

P228
263
262
261
260
P229
237
238
P227
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
P852
P851
P230
P226
P232
P231
P233
P234
Valley Ave. E
P856
P855
P854
P239*
P237
P238
Legend:
Project APE
Project ROW
2015 project area
Shovel test, negative
Parcel boundary
P# Parcel number
0
400
Feet
Meters
0
100

Figure B.17


44
P2007
P857
P2006
P239*
P237
P238
P236
Valley Ave. E
P240
P242
P241
P243
P244
impenetrable blackberry
UPRR
P252
P250
P251
P249
P248
P254
P255
P254
P257
P257
P2002
P2000
Figure B.18
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
Meters
0
100


P496
P244
P497
21
P500
P498
P501
P561
P562
P502
P504
P503
P499
P563
P247
P505
P508
P571
24
P563
P564
P246
P245
P506
P511
P565
P507
Valley Ave. E
P566
P512
P509
P260
UPRR
P515
P513
P510
P514
P266
300
298
299
22
P267
23
P268
303
302
301
P261
307
306
305
304
P269
impenetrable blackberry
308
309
310
311
315
P270
312
316
319
317
313
320
P264
P265
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.19

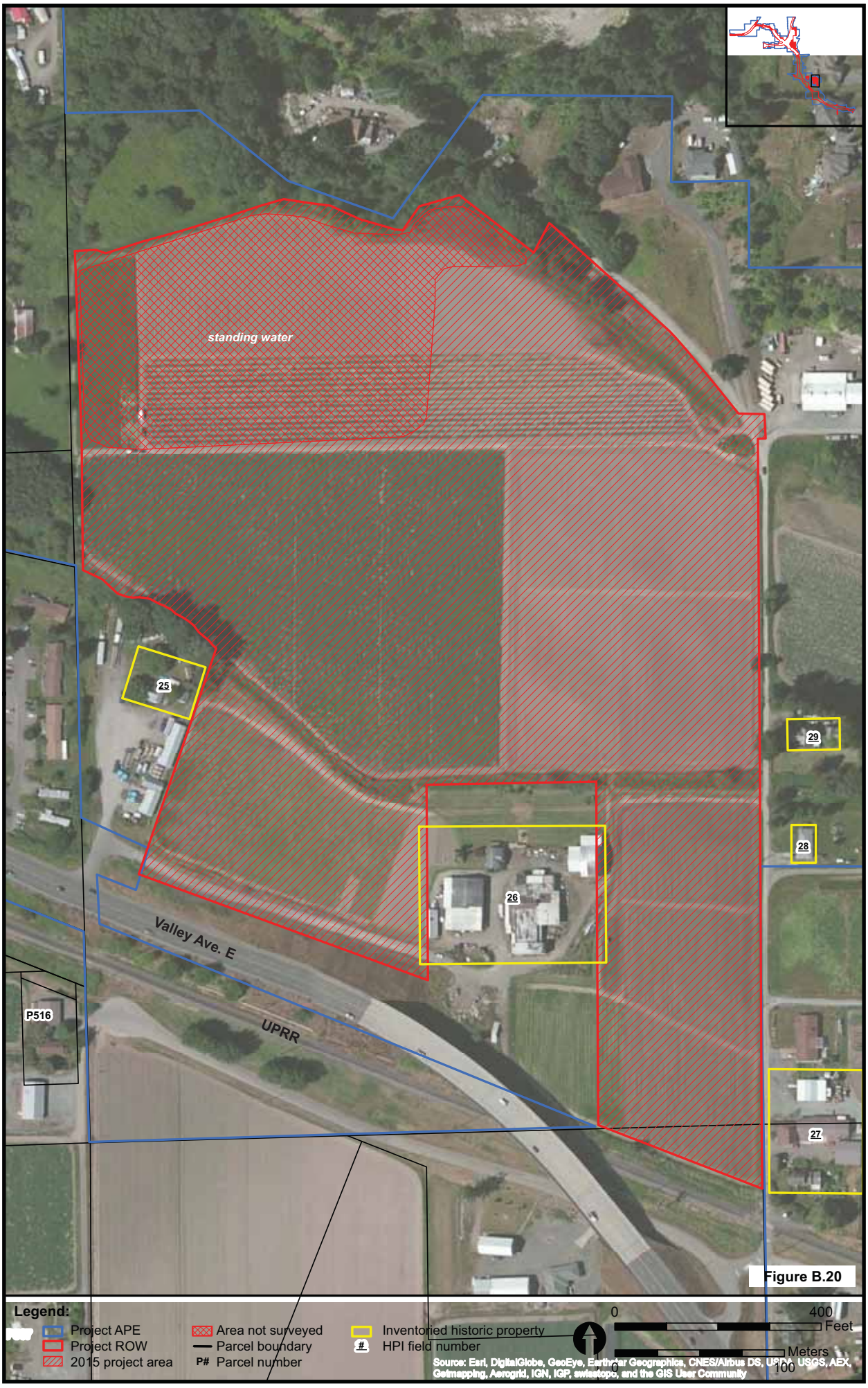
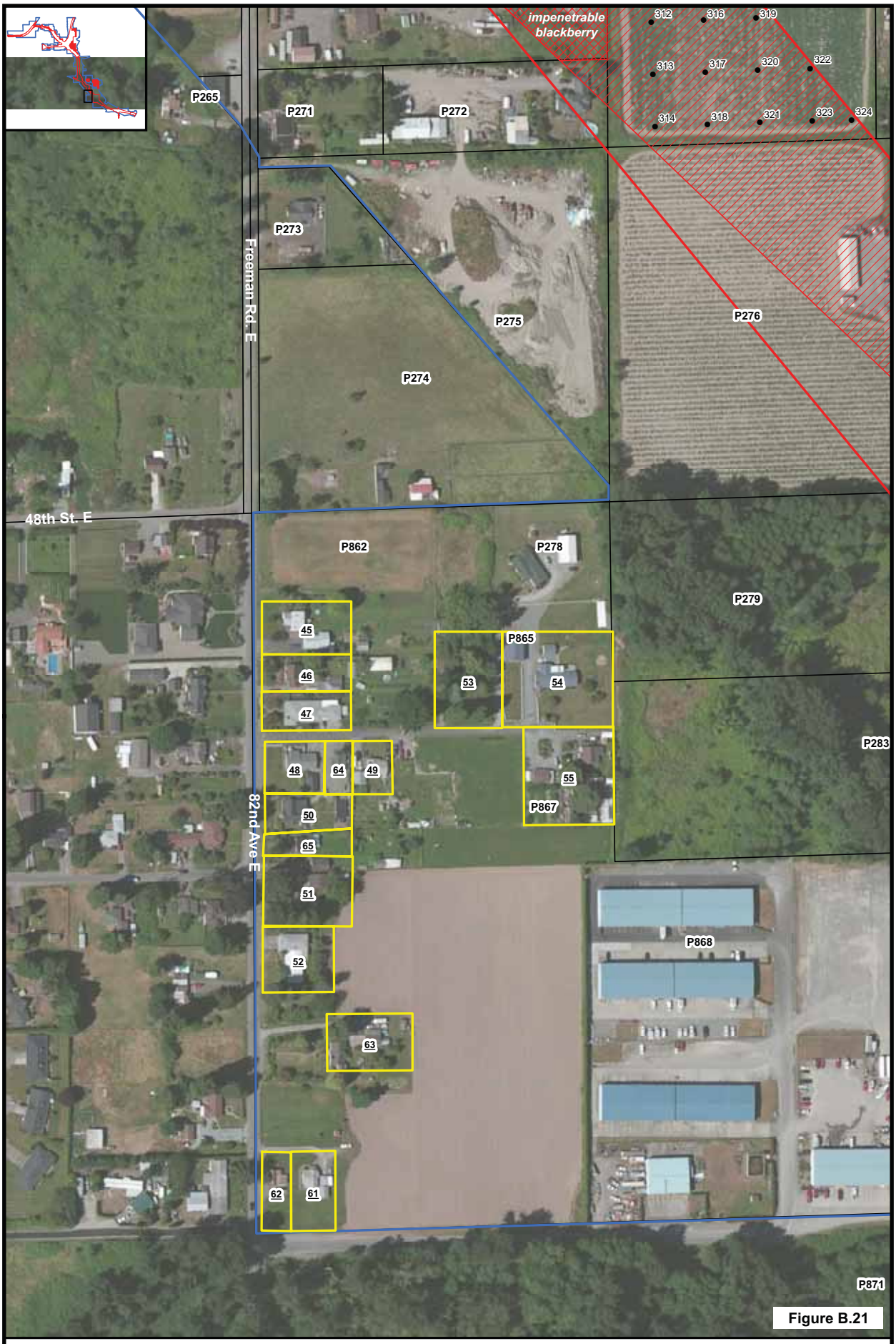

standing water
25
26
27
28
29
P516
Valley Ave. E
UPRR
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Inventoried historic property
HPI field number
0
400
Feet
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.20


impenetrable blackberry
312
316
319
313
317
320
322
314
318
321
323
324
P265
P271
P272
P273
Freeman Rd. E
P275
P276
P274
48th St. E
P862
P278
P279
45
46
47
53
P865
54
48
64
49
55
P867
P283
50
65
82nd Ave E
51
52
P868
63
62
61
P871
Figure B.21
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
0
400
Feet
0
100
Meters
Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


31
30
P277
287
P280
288
289
291
290
292
294
293
295
296
297
P281
P524
P523
P2008
56
Valley Ave. E
P525
P526
P527
P528
P529
P530
P531
P532
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
Inventoried historic property
HPI field number
0
400
Feet
Meters
0
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.22

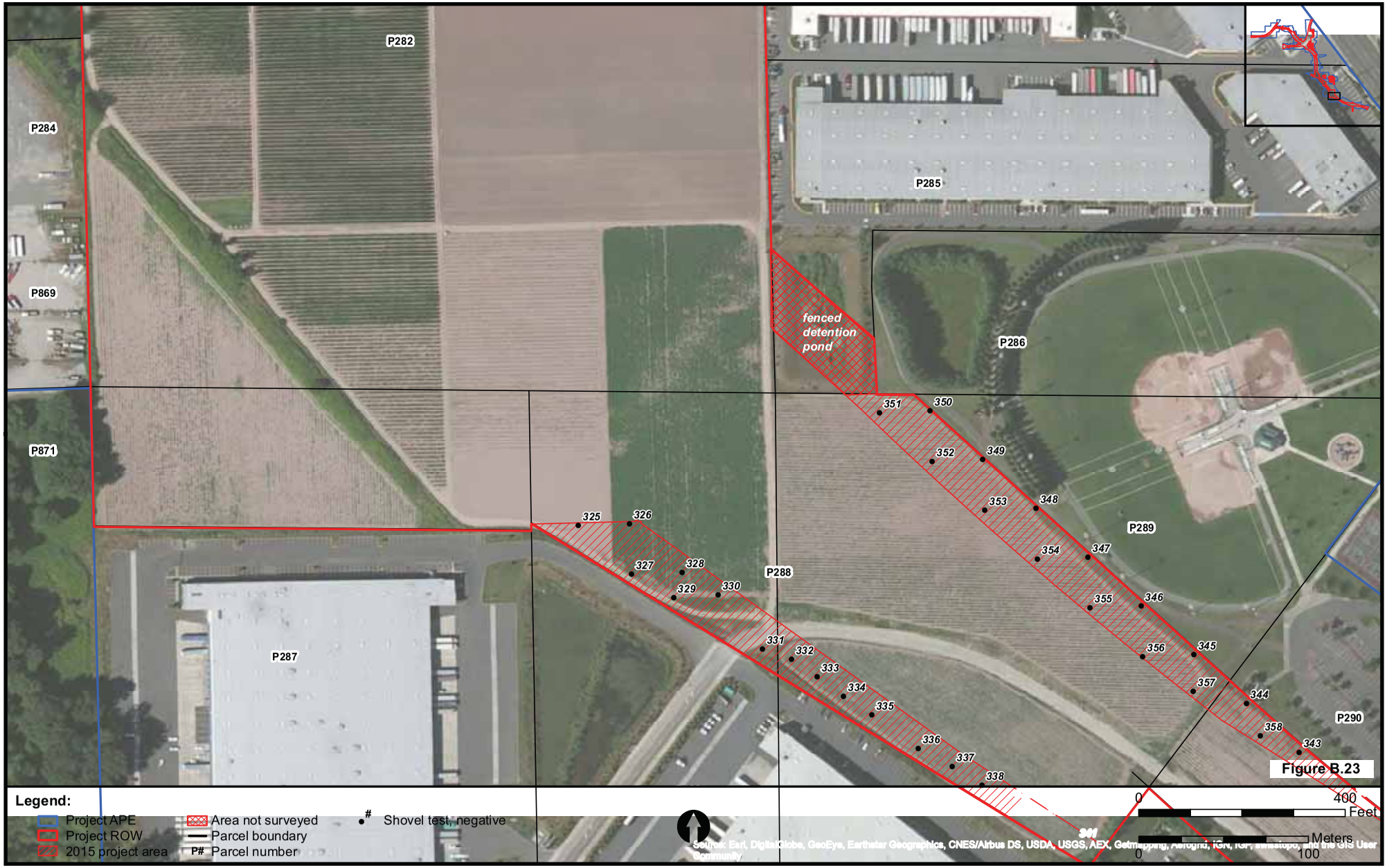

P282
P284
P285
P869
P286
fenced detention pond
P871
P289
P288
P287
P290
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
Legend:
Project APE
Project ROW
2015 project area
Area not surveyed
Parcel boundary
P# Parcel number
Shovel test, negative
0
400
Feet
0
100
Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.23


339
340
341
P288
342
P290
P297
P304
P288
P292
P298
P294
P293
P334
P296
P335
P299
P295
P300
P336
P874
N Levee Rd.
Puyallup River
Figure B.24
Legend:
Project APE
Project ROW
2015 project area
Shovel test, negative
Parcel boundary
P# Parcel number
0
400
Feet
Meters
0
100

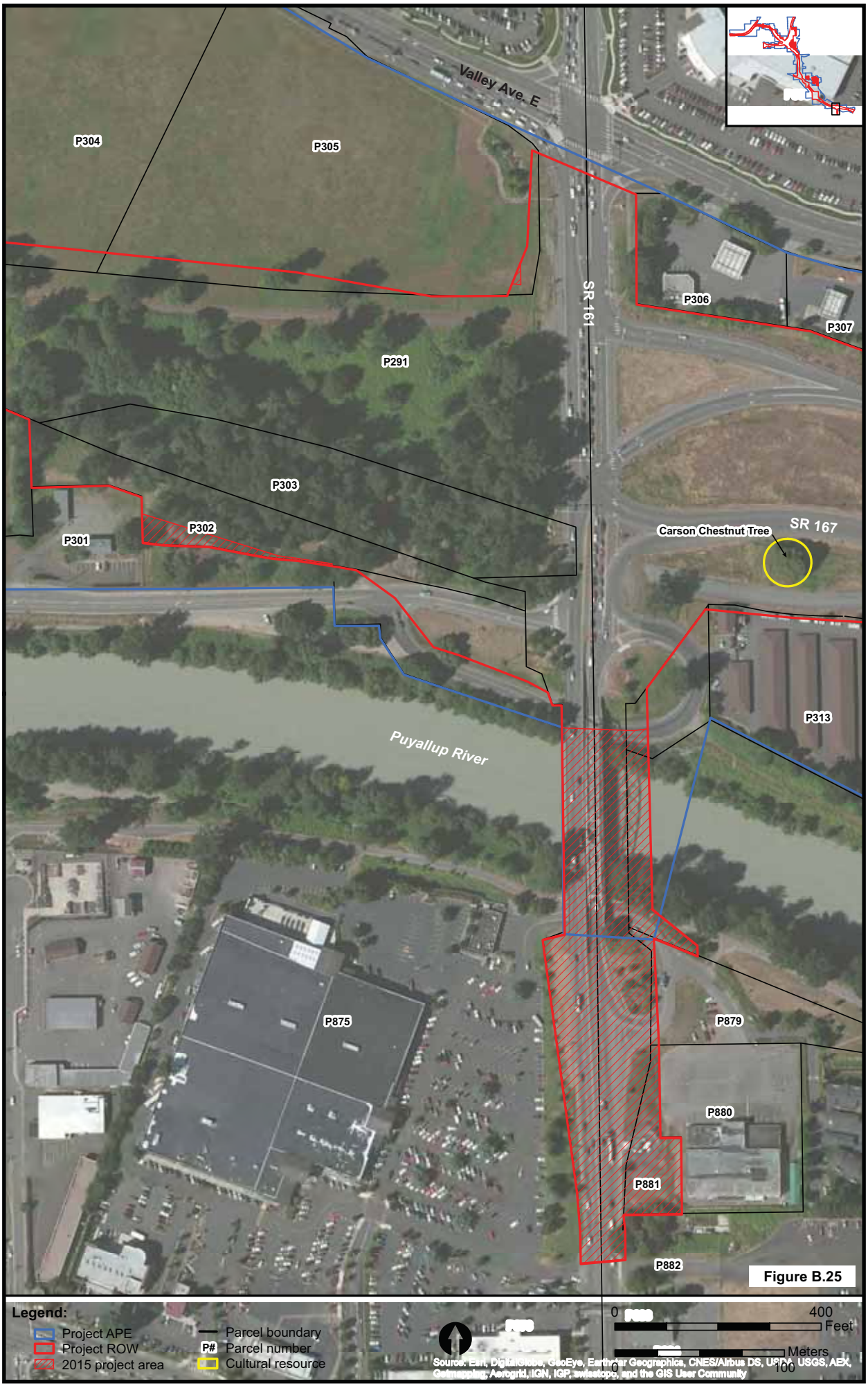

Valley Ave. E
SR 161
SR 167
Puyallup River
Carson Chestnut Tree
P304
P305
P306
P307
P291
P303
P302
P301
P313
P875
P879
P880
P881
P882
Legend:
Project APE
Project ROW
2015 project area
Parcel boundary
P# Parcel number
Cultural resource
0
400
Feet
Meters
100
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure B.25



Figure B.26

Legend:

- Project APE
- Project ROW
- Parcel boundary
- P# Parcel number
- Inventoried historic property
- # HPI field number

0 400 Feet

0 100 Meters

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Figure B.27

Legend:

- Project APE
- Project ROW
- 2015 project area
- Parcel boundary
- P# Parcel number
- Inventoried historic property
- # HPI field number

0 400 Feet

0 100 Meters

Appendix C

Washington State Inventory Forms:

Archaeological Site Update Form (45PI488)
Historic Property Inventory Forms (by Field Number)

CONTINUATION/ ADDENDUM SHEET

SITE DESCRIPTION

On October 14th, 15th, and November 3rd of 2015, AHS conducted a survey for the WSDOT SR 167 Tacoma to Puyallup - New Freeway project which included shovel testing around the site 45PI488 perimeter to refine the site boundary. A total of 19 shovel tests were excavated in proximity to the original 45PI488 site boundary.

Twelve shovel tests were excavated in a 20 x 20 meter grid over WSDOT project parcels 133 and 134. Shovel test 9 to the north of the previously defined site boundary contained one small fire-modified rock (FMR) fragment. Three additional shovel tests were excavated 5 meters east, west, and north of shovel test 9. Shovel test 13 also contained a small FMR fragment and three additional shovel tests were placed 5 meters east, west, and north of shovel test 13. An additional shovel test was excavated between the southern site boundary and SR 99. Each FMR fragment was recorded on a standard AHS field form, photographed, and placed in a Ziploc bag and backfilled in the upper 40 cm of the shovel test from which it originated. No additional cultural material was found. The site boundary is extended approximately 10 meters north of its original dimensions (see page 2 of 2).

RESEARCH REFERENCES

Yamamoto, Christopher, Stephen Emerson, and Rebecca Stevens

2015 *Cultural Resources Investigations for the Washington State Department of Transportation's SR 167 Tacoma to Puyallup New Freeway, Pierce County, Washington*. Short Report DOT15-04. Archaeological and Historical Services, Eastern Washington University, Cheney.

SKETCH MAP

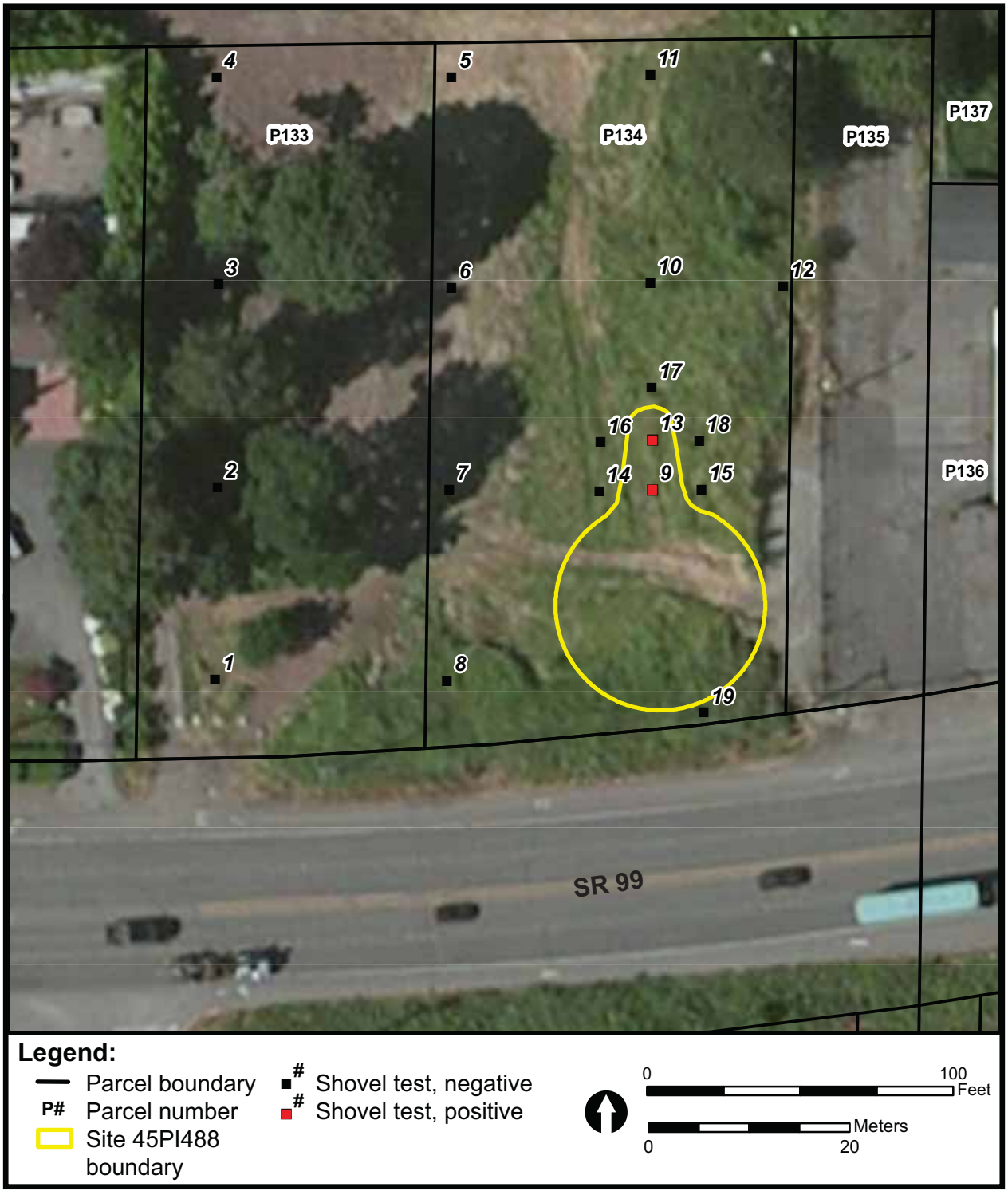


Figure 1. *Aerial photograph showing shovel tests excavated in the site 45PI488 area and the updated site boundary.*

Historic Inventory Report

Location

Field Site No. SR167-1 DAHP No.

Historic Name: House at 3401 12th Street E

Common Name: Smith House

Property Address: 3401 12th St E, Fife, WA

Comments:

Tax No./Parcel No. 3020000062

Plat/Block/Lot

Acreage < 1

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	02			Pierce	TACOMA SOUTH

Coordinate Reference

Easting: 1172700

Northing: 703313

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Shane and Tammy Smith

Owner Address: 5531 Denmark Road

City: Ellensburg State: WA Zip: 98926-7855

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Commerce/Trade - Professional

Plan: Rectangle

Stories: 1

Structural System: Platform Frame

Changes to Plan: Slight

Changes to Interior: Extensive

Changes to Original Cladding: Extensive

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Veneer	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1939 Built Date

1976 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This former residence was built in 1939, probably as a simple boxy cottage, a precursor of the evolving Minimal Traditional style. It is a tiny remnant of a former residential neighborhood. It was remodeled in 1976, according to real estate records, and probably modified again more recently. All visible materials, including roofing, wall cladding, and windows are recent alterations. Due to these extensive modifications of the original construction materials, this building is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This building is a former single family residence that has been converted to commercial use. It is a modest wood frame structure with a rectangular plan and an attached car port in the rear. The rather steeply pitched side-gabled roof is covered with composition shingles, and sports three rectangular sky lights on the front slope. The abrupt eaves are enclosed. The foundation is poured concrete. Exterior wall surfaces are clad with composition materials, including faux brick in the gable faces and the lower skirts of the walls, and vertical wall board above the skirts. Windows are all vinyl sash sliding units. There is a small gabled canopy above the central front entry, supported by two knee braces. The wood panel and glass door is approached by a wood frame inclined ramp with railings.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) and west elevations
2015



2015

Historic Inventory Report

Location

Field Site No. SR167-2 DAHP No.

Historic Name: House at 5302 4th Street E

Common Name: Brown House

Property Address: 5302 4th St E, Fife, WA 98418-1502

Comments:

Tax No./Parcel No. 0320011056

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	01			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179002

Northing: 705660

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: James and Hollis Brown

Owner Address: 1725 S. 44th Street

City: Tacoma State: WA Zip: 98418-1502

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: T-Shape

Stories: 1

Structural System: Platform Frame

Changes to Plan: Moderate

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Shingle - Coursed	Gable - Cross Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Cross Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction: 1951 Built Date

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was constructed in 1951, when the Minimal Traditional style was coming into its own. The basic boxy, gabled design is typical, but the eaves are wider than what is usual for the style. The wood shingle cladding is reminiscent of other styles. The most telling alterations are the replacement of the original wood sash windows with modern vinyl sash units. Due to these modifications and the non-distinctive architectural design, this house is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with a semi-T-shaped plan, with gables oriented to three directions. A short gabled extension on the west elevation and a shed-roofed enclosed rear porch complete the layout. The roof is covered with composition shingles and has moderately-wide, enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are clad with coursed wood shingles. All windows are vinyl sash sliding units. Some of the larger ones have faux wood shutters. The front entry is situated beneath a gabled porch canopy supported by two square wood posts. The porch deck and railing are wood frame. The house is accompanied by several wood frame sheds and an unattached side-gabled garage. The later has a composition roof, shingle cladding, and a sliding vehicle entry door.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
North (front) and west elevations
2015



View to the east
Detached garage, west elevation
2015



View to the southeast
North (front) and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-3 DAHP No.

Historic Name: House at 5312 4th Street E

Common Name: Yamamoto House

Property Address: 5312 4th St E, Fife, WA 98424-2707

Comments:

Tax No./Parcel No. 0320011098

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	01			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179142

Northing: 705656

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Remedios Yamamoto

Owner Address: 5312 4th Street E

City: Fife State: WA Zip: 98424-2707

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Veneer - Vinyl Siding	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1951 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was constructed in 1951 and is an early prototype of the Ranch Style, which in the coming decade would dominate the American residential landscape. The horizontal appearance and shallow-pitched roof are typical. The open eaves and detached garage are not. The major modifications are the replacement of original windows and siding. Due to these alterations, this house is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This 1-story residence is a wood frame structure with a rectangular plan. The shallow-pitched roof is covered with composition shingles and has moderately-wide, open eaves. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl siding with corner boards. Windows are metal sash sliding units. The central front entry contains a double-set of wood panel doors and is flanked by faux stone veneer. The house is accompanied by a newer wood frame detached garage with a shallow-pitched roof covered with composition shingles. The walls are clad with vertical board siding. The double-wide vehicle entry door is metal.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
North (front) and west elevations
2015



View to the south
North (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-4 DAHP No.

Historic Name: House at 5416 4th Street E

Common Name: Flannigan House

Property Address: 5416 4th St E, Fife, WA

Comments:

Tax No./Parcel No. 0420062073

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179530

Northing: 705640

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: USA In Trust C/O Katie Flannigan

Owner Address: 9920 79th Street SW

City: Lakewood State: WA Zip: 98498-3210

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Irregular
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Coursed	Varied Roof Lines	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1940 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house and attached garage present a hodgepodge appearance that nonetheless seem to been constructed at the same time, in 1940. The boxy shape and the short eaves evoke the Minimal Traditional style; otherwise the building has a whimsical, vernacular feeling. The juxtaposition of the large garage and the receding house are unusual. Alterations to the fenestration are modest, and most of the construction materials appear to be original. Nevertheless, this house lacks sufficient architectural distinction for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence consists of a prominent hip-roofed garage, and a side gabled 1 1/2-story house, joined together at the rear of the garage by a gabled 1-story section, forming a sort of L-shape. All roofs are steeply pitched,are covered with composition shingles, and have abrupt, enclosed eaves. A tall and narrow brick chimney emerges from the area where the house and garage are joined. All exterior elevations are clad with coursed wood shingles. The side-gabled portion features a prominent gabled wall dormer. Windows of both the house and the garage are a combination of older wood sash and newer vinyl sash double-hung windows. The front entry is recessed and is approached by wood steps and railings. The garage has two vehicle entries with modern metal lift-up doors.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
Attached garage, north and east elevations
2015



View to the south
North (front) elevation
2015



View to the southeast
North (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-5 DAHP No.

Historic Name: House at 506 56th Avenue E

Common Name: Belsky House

Property Address: 506 56th Ave E, Fife, WA

Comments:

Tax No./Parcel No. 0420062112

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1180110

Northing: 705417

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Jeffery Belsky

Owner Address: 3324 47th Street NE

City: Tacoma State: WA Zip: 98422-4615

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Coursed Wood - Boards	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Unknown	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1912 Built Date
1950 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The house, and probably the garage, were constructed in 1912 and remodeled in 1950. Both buildings have apparently undergone sporadic maintenance, resulting in a hodgepodge and deteriorated appearance. A small portion of the house retains wood shingle siding that is probably original, but other materials appear to have replaced or altered. This property is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a wood frame structure with a rectangular plan. The side-gabled roof is covered with composition shingles and has moderately-wide, open eaves. Exterior wall surfaces are partially clad with coursed wood shingles that are probably original material, but most walls are covered with some kind of wall board. Windows are wood sash, but appear to be slipshod replacements. The front entry is recessed within a gabled vestibule. Adjacent to the house is a detached wood frame garage. The gabled roof is currently covered with plastic sheeting. Exterior walls consist of wood planks. All fenestration has been removed except for a wood panel pedestrian door to the left of the vehicle entry.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
Front (north) and east elevations
2015



View to the south
Garage, north elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-6 DAHP No.

Historic Name: House at 415 54th Avenue E

Common Name: Salas House

Property Address: 415 54th Ave E, Fife, WA 98424-2721

Comments:

Tax No./Parcel No. 0420062147

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179421

Northing: 705534

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Jorge Salas

Owner Address: 415 54th Avenue E

City: Fife State: WA Zip: 98424-2721

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Irregular
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Combed	Gable - Side Gable	Metal - Corrugated Asphalt / Composition - Rolled

Foundation:	Form/Type:
Unknown	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1945 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1945. It is a modest and nondescript house, fairly intact except for replacement of most windows. It has an unusual floor plan, but otherwise exhibits no architectural distinction. It is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a wood frame building with an unusual plan. The basic 1-story, side-gabled portion has an L-shape extension to the west. The main (side-gabled) portion has a corrugated metal roof, while the L-shaped portion has a roof covered with rolled asphalt. The eaves are short and open. A cinder block chimney emerges from near the point where the two portions merge. The foundation is not visible. Exterior wall surfaces are clad with combed wood shingles. A few fixed wood sash windows are retained, but most windows have been replaced by metal sash sliding units.

Major Bibliographic References:

Photos



View to the southeast
North (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-7 DAHP No.

Historic Name: House at 501 54th Avenue E

Common Name: Salas House 2

Property Address: 501 54th Ave E, Fife, WA 98424-2721

Comments:

Tax No./Parcel No. 0420062069

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179413

Northing: 705456

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Jorge Salas

Owner Address: 415 54th Avenue E

City: Fife State: WA Zip: 98424-2721

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle Stories: 1

Structural System: Platform Frame

Changes to Plan: Moderate

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood - Clapboard	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit: Architecture/Landscape Architecture

Other:

Date of Construction: 1939 Built Date

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1939. It exhibits no particular style. The wholesale replacement of original windows precludes National Register of Historic Places eligibility for this property.

Description of Physical Appearance: This residence is a wood-frame building with a front-gabled rectangular plan. An adjacent front-gabled garage is attached to the house by a semi-enclosed porch with a side-gabled roof. An enclosed gabled porch extends from the west (front) elevation of the house. The roof is covered with composition shingles and has moderately wide, open eaves. A brick chimney emerges from the roof crest of the house. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal wood siding with corner boards. All windows are vinyl sash and include both fixed and sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-8 DAHP No.

Historic Name: House at 520 54th Avenue E

Common Name: Van Halder House

Property Address: 520 54th Ave E, Fife, WA

Comments:

Tax No./Parcel No. 0320011015

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	01			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179184

Northing: 705040

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2105

Field Recorder: S. Emerson

Owner's Name: Van Halder LLC

Owner Address: P.O. Box 595

City: Puyalllup State: WA Zip: 9837100181

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Shingle - Combed Concrete - Block	Shed Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Unknown	Single Family - Side Gable

Narrative

Study Unit
Architecture/Landscape Architecture

Other

Date of Construction: 1951 Built Date

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The original portion of this building was constructed in 1951. It appears that the property was converted to commercial use at some later date, and the concrete block addition was attached to it. The original house is a modest rendition of the Minimal Traditional style, characterized by the boxy shape, the front-gable extension, and the very short, enclosed eaves. The building has been vacant for some time. Although integrity of historic appearance and architectural materials is good, this building does not exhibit sufficient distinction for listing on the National Register of Historic Places.

Description of Physical Appearance: This 1-story former residence consists of a wood frame building with a concrete block addition. The wood frame portion is side-gabled with a gable extension to the front. The roof is covered with composition shingles and has abrupt, enclosed eaves. A brick chimney emerges near the crest of the roof ridge. Exterior wall surfaces of the wood frame portion are clad with combed wood shingles, while the gable faces are clad with vertical boards with scalloped lower edges. The windows are wood sash units divided into multiple horizontal panes. The concrete block addition has a shed roof covered with composition shingles. The eaves are moderately wide and open. The windows are similar to those of the wood frame house.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



2015



View to the southwest
East (front) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-9 DAHP No.

Historic Name: House at 602 54th Avenue E

Common Name: Van Halder House 2

Property Address: 602 54th Ave E, Fife, WA

Comments:

Tax No./Parcel No. 0320011085

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	01			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179164

Northing: 704951

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Van Halder LLC

Owner Address: P.O. Box 595

City: Puyallup State: WA Zip: 98371-0181

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Commerce/Trade - Business
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Extensive
Changes to Original Cladding: Slight
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1920 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: A search of real estate records did not result in getting a year built date for this building. The enclosed nature of the eaves, and the lack of Craftsman elements, indicate it probably predates the popularity of that style, which was at its peak in the 1920s and 1930s. So a date of 1920, or earlier, is probably an educated guess. Several tripartite windows and the exterior masonry chimney may have been early precursors of the Craftsman style. About half of the original wood sash windows have been replaced with modern vinyl types. Otherwise, the building exhibits good integrity of its historic appearance and original construction materials. It does not, however, possess sufficient distinction to justify National Register of Historic Places eligibility.

Description of Physical Appearance: This former residence is a 1 1/2-story wood frame building consisting of a side-gable main portion and short gabled extensions to the front (east) and rear. The roof is covered with composition shingles and has moderately-wide enclosed eaves. A brick chimney emerges from the roof crest. The forward gable is bell cast on the right side, extending as a canopy over the central front door, which is slightly recessed. A full-height exterior brick chimney is situated at the center of the forward facing gable face, penetrating the gable peak. Exterior wall surfaces are clad with clapboard siding of staggered widths. The foundation is poured concrete. Windows are a mix of original wood sash double-hung windows and modern vinyl sash double-hung and sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the northwest
East (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-10 DAHP No.

Historic Name: House at 606 54th Avenue

Common Name: Walsborn House

Property Address: 606 54th Ave E, Fife, WA

Comments:

Tax No./Parcel No. 032211066

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R03E	01			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1179191

Northing: 704891

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Warren Walsborn

Owner Address: 606 54th Avenue E

City: Fife State: WA Zip: 98422-2726

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Irregular
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Intact
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Combed	Hip Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1951 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1951 and represents a kind of prototype of the Ranch Style, with its shallow-pitched roof, overhanging enclosed eaves, and rectangular profile brick chimney. Despite good integrity of its historic appearance and original construction materials, it is not a particularly distinctive example, and is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This is a 1-story house consisting of a side-gabled portion and a hip-roofed section projecting forward from the right side. The side gabled portion has a gablet, facing forward, with a ventilation louver. The roof is covered with composition shingles and has fairly wide, enclosed eaves. A brick chimney emerges from the gable crest. Exterior wall surfaces are clad with combed wood shingles. The foundation is poured concrete. Windows are wood sash and include both picture and double-hung units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the west
Front (east) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-11 DAHP No.

Historic Name: House at 6020 8th Street E

Common Name: Mattich House

Property Address: 6020 8th St E, Fife, WA 98424-1321

Comments:

Tax No./Parcel No. 0420063052

Plat/Block/Lot

Acreage About 1

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	PUYALLUP

Coordinate Reference

Easting: 1181265

Northing: 704239

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Robert Mattich

Owner Address: 6020 8th Street E

City: Fife State: WA Zip: 98424-1321

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Intact
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Brick - Common Bond	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1955 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1955, just as America's love affair with the Ranch Style was achieving full impetus. Diagnostic elements of the style exhibited here include the shallow-pitched roof, the large masonry chimney, the enclosed and widely overhanging eaves, and the attached garage. This is a classic rendition of the hip-roofed, brick clad version of the Ranch Style. The remarkable clarity of the horizontal lines and the uncomplicated presentation of the architectural features are what give this house the distinction necessary for National Register of Historic Places eligibility.

Description of Physical Appearance: This house is a 1-story wood frame building with a rectangular plan. The hipped roof has a very shallow pitch and is covered with composition shingles. A rectangular cross-section brick chimney emerges from near the roof crest. The eaves are widely overhanging and enclosed. The foundation is poured concrete. Exterior wall surfaces are clad with brick. The central front entry and the primary picture window are placed beneath a hip-roofed canopy supported by two wood posts. The wood sash windows include both picture and casement types. At the far right is the wood roll-up door of the attached garage.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the south
North (front) elevation
2015



View to the southwest
North (front) and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-12 DAHP No.

Historic Name: House at 1223 67th Avenue E

Common Name: Hovland House

Property Address: 1223 67th Ave E, Fife, WA 98424-1310

Comments:

Tax No./Parcel No. 0420064195

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	PUYALLUP

Coordinate Reference

Easting: 1181836

Northing: 702621

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Kathleen Hovland

Owner Address: 1223 62nd Avenue E

City: Fife State: WA Zip: 98424-1310

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: L-Shape

Stories: 1 1/2

Structural System: Platform Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Extensive

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Wood	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction: 1936 Built Date

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1936, an early version of the Minimal Traditional Style. Diagnostic features include the boxy shape, the projecting front gable, and the short enclosed eaves. Although the house retains much of its historic appearance, the wholesale replacement of windows and exterior siding renders it ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1 1/2-story wood frame building with a side-gabled plan. A front-gabled extension projects from the right side, forming an L-shape. The roof is covered with composition shingles and has short enclosed eaves. A brick chimney emerges from the roof crest. The foundation is poured concrete. The house has two pop-out bays, one in front and one in back. A hip-roofed enclosed porch is attached to the north side. Exterior wall surfaces are clad with horizontal siding with faux wood grain. The front entry is placed in the crook where the two gabled sections meet. The rear pop-out bay contains a glass block window. All other windows are vinyl sash, and include fixed, double-hung, and casement types. Behind the house is a combined garage/mother-in-law apartment. It is 1-story, side-gabled, and wood frame. Like the house, it has a composition shingle covered roof with short enclosed eaves, and a poured concrete foundation. Exterior wall surfaces are clad with drop siding with corner boards. The windows are vinyl sash and include both fixed and casement types. The vehicle entry consists of two swinging wood doors. A shed roof canopy runs along the apartment portion of the front, supported by four wood posts.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
Garage/Mother-in-law apartment north elevation
2015



View to the southeast
West (front) and north elevations
2015



View to the northeast
West (front) and south elevations
2015



View to the southwest
East (rear) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-13 DAHP No.

Historic Name: Metal sheds at 6708 Pacific Highway E

Common Name: WSDOT property

Property Address: 6708 Pacific Hwy E, Fife, WA

Comments:

Tax No./Parcel No. 0420064119

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	PUYALLUP

Coordinate Reference

Easting: 1183353

Northing: 701784

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: WSDOT

Owner Address:

City: State: Zip:

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Unknown
Current Use: Vacant/Not in Use
Plan: Rectangle
Stories: 1
Structural System: Steel
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Not Applicable
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
None	Metal - Corrugated	Shed Gable	Metal - Corrugated

Foundation:	Form/Type:
Concrete - Poured	Utilitarian

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1960 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The construction dates of these sheds is a mere guess, as there is nothing diagnostic about them that would suggest their vintage. They are vacant and in poor condition. They are not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This property contains two deteriorated sheds, each open to one side, constructed of corrugated metal sheets over steel framework.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
Shed 1, west elevation
2015



View to the west
Shed 2, east elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-14 DAHP No.

Historic Name: House at 423 Porter Way

Common Name: Pulliam House

Property Address: 423 Porter Way, Milton, WA

Comments:

Tax No./Parcel No. 5990200420

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1186355

Northing: 704645

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/21/2015

Field Recorder: S. Emerson

Owner's Name: Billie Pulliam

Owner Address: P.O. Box 631

City: Milton State: WA Zip: 98354-0631

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Slight
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1950 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1950 and is a common example of the World War II Cottage, with its simple front-gabled plan and moderately-wide enclosed eaves. The primary exterior alteration is the whole-sale replacement of original wood sash windows with vinyl sash units. This modest residence is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with a rectangular, side-gabled plan. The roof is covered with composition shingles and has moderately-wide enclosed eaves. Exterior wall surfaces are clad with wide horizontal wood siding. The foundation is poured concrete. An enclosed porch with a flat roof is attached to the rear. The building is situated on a slope, leaving room for a daylight basement level to the west. A flat canopy shelters the entry here. The front entry is centered on the north elevation and contains a metal door. All windows are modern metal sash picture and sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
North elevation
2015



View to the northeast
West and south (rear) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-15 DAHP No.

Historic Name: House at 422 Porter Way

Common Name: Bauer House

Property Address: 422 Porter Way, Milton, WA

Comments:

Tax No./Parcel No. 5990200280

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1186321

Northing: 704788

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/13/2015

Field Recorder: S. Emerson

Owner's Name: Billie Bauer

Owner Address: 9711 Fremont Avenue N

City: Seattle State: WA Zip: 98103-3140

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Platform Frame
Changes to Plan: Unknown
Changes to Interior: Unknown
Changes to Original Cladding: Moderate
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood	Gable - Front Gable Flat with Eaves	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1955 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence and attached garage were built in 1955 and reflects no particular architectural style. The scale of the garage seems out of proportion compared with the house. It's possible it is a later addition. The siding has probably been altered, and the metal shaft windows are likely not original as well. Due to these alterations, this building is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a wood-frame building with a rectangular plan and a flat roof with enclosed eaves. A large 2-car garage with a gabled roof is attached to the front, nearly dwarfing the house. The roof is covered with composition shingles. A brick chimney arises from behind the garage. Exterior wall surfaces are clad with vertical board siding, except for the garage gable face, which features horizontal wood siding. Visible windows are metal sash picture units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the north
South (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-16 DAHP No.

Historic Name: House at 709 5th Avenue

Common Name: Bauer House 2

Property Address: 709 5TH, MILTON, WA

Comments:

Tax No./Parcel No. 5990200270

Plat/Block/Lot Section 05 Township 20 Range 04 Quarter 24 MILTON

Acreage 0.225994920423

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1186428

Northing: 704796

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Bruce and Billie Bauer

Owner Address: 9711 Freemont Avenue N

City: Seattle State: WA Zip: 98103-3140

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Combed	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1955 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1955, as the popularity of the Ranch Style was rapidly increasing. This is a modest and muted version of the style, exhibited here by the shallow-pitched roof with enclosed eaves. This building has good integrity except that all of the original wood sash windows have been replaced by vinyl sash units, disqualifying this residence from National Register of Historic Places eligibility.

Description of Physical Appearance: This house is a 1-story wood-frame building with a rectangular plan. It has a shallow-pitched, hipped roof covered with composition shingles, and moderately-wide enclosed eaves. A brick chimney emerges from near the apex of the roof. The foundation is poured concrete. Exterior wall surfaces are clad with combed wood shingles. The vinyl sash windows include both fixed picture and sliding types. The central front entry contains a wood panel door. A carport with a flat roof is attached to the north side.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northwest
East elevation
2015



View to the northwest
South (front) and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-17 DAHP No.

Historic Name: House at 511 4th Avenue

Common Name: Davis House

Property Address: 511 4th Ave, Milton, WA

Comments:

Tax No./Parcel No. 5990000540

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1185604

Northing: 705282

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Sheri M. Davis

Owner Address: 5307 118th Avenue Ct. E

City: Edgewood State: WA Zip: 98372-9287

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: L-Shape

Stories: 1

Structural System: Platform Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Extensive

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Gable - Gable-on-Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - WWII Era Cottage

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1928 Built Date

1956 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance:

This residence was built in 1928. It is uncertain what it's original appearance was, but a 1956 remodel gave it a decidedly World War II Cottage appearance, while the shallow-pitched roof is a harbinger of the Ranch Style. The wholesale replacement of original wood sash windows with vinyl sash units precludes National Register of Historic Places eligibility for this house.

Description of Physical Appearance:

This building is a 1-story wood-frame building with an L-shaped plan consisting of the primary hip-roofed portion and a forward projecting gable. At the left of the projecting gable is a gabled entry vestibule. The roof is shallow-pitched and covered with composition shingles. The abrupt, enclosed eaves feature cornice returns in the gables. A brick chimney emerges from near the apex of the roof. The foundation is poured concrete. Exterior wall surfaces are clad with wide horizontal wood siding. All windows are vinyl sash sliders. The front entry vestibule is approached by a wood frame deck and steps with railings.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-18 DAHP No.

Historic Name: House at 326 Emerald Street

Common Name: Annala House

Property Address: 326 Emerald St, Milton, WA

Comments:

Tax No./Parcel No. 0420052004

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1185729

Northing: 705750

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 01/22/2015

Field Recorder: S. Emerson

Owner's Name: Lisa Annala

Owner Address: 14079 W. Larkspur Drive

City: Surprise State: AZ Zip: 85379-5525

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: L-Shape
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Veneer - Vinyl Siding	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1939 Built Date
1970 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1939, remodeled in 1970, and subjected to further modifications at a more recent date. The result is a house that appears modern, due to the replacement of nearly all exterior features with modern materials. This lack of integrity precludes National Register of Historic Places eligibility for this building.

Description of Physical Appearance: This house is a 1-story wood-frame house consisting of the primary front gable portion, with a gabled extension to the rear, and a gabled extension from the rear to the east, creating an L-shaped plan. The roof is covered with composition shingles and has wide, enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl siding. Windows are all vinyl sash and include both fixed and sliding multiple-pane units. The central wood panel and glass front door is approached by a wood deck and steps.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the north
South (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-19 DAHP No.

Historic Name: House at 411 Birch Street

Common Name: Bean House

Property Address: 411 Birch St, Milton, WA 98354-9621

Comments:

Tax No./Parcel No. 5990000340

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1186061

Northing: 706346

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Marie and Chester Bean

Owner Address: 411 Birch Street

City: Milton State: WA Zip: 98354-9621

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Slight
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Shingle - Coursed	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Unknown	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1900 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: If this house was indeed constructed in 1900, as stated in real estate records, it is a very early example of the Craftsman Style, which dominated residential design into the 1930s. Classic elements of the style seen here include the widely overhanging eaves, exposed rafter ends, barge boards, and full-width front porch with battered post supports. The concrete front porch deck supports are new, but otherwise this building retains excellent integrity of both its historic appearance and original construction materials. As an outstanding and early example of a Craftsman house, it is eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with a rectangular, front-gabled plan. The roof is covered with composition shingles and features widely overhanging eaves with exposed rafter ends, while ornamental cut-out barge boards are present in the gables. Exterior wall surfaces are clad with coursed wood shingles. At the front of the house is a full-width front porch. The roof here is supported by an open M-truss that serves a decorative as well as a functional purpose. The truss is in turn supported by battered wood posts with shingle cladding. The wood deck of the porch is supported by newer concrete piers. Attached to the rear of the house is an enclosed back porch with a hipped roof. The windows are wood sash and include mostly picture and double-hung units. There is a diamond-shaped fixed wood sash window on the west elevation. On the east elevation is a pop-out bay window with a gabled roof and ornamental barge boards, and knee braces for further support.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East elevation, pop-out bay
2015



View to the southeast
North (front) and west elevations
2015



View to the west
East elevation and front porch
2015

Historic Inventory Report

Location

Field Site No. SR167-20 DAHP No.

Historic Name: House at 416 Birch Street

Common Name: Duszynski House

Property Address: 416 Birch St, Milton, WA 98354-9620

Comments:

Tax No./Parcel No. 5990000140

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	05			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1186155

Northing: 706594

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: MIchael Duszynski

Owner Address: 416 Birch Street

City: Milton State: WA Zip: 98354-9620

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Veneer - Vinyl Siding	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1900 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1900 as a Craftsman Style home. Modern renovations have given it a more modern appearance. The exposed rafter ends have been covered with vinyl. The only Craftsman elements left are the full-width front porch, with its open truss and knee braces. Due to these extensive alterations, this house is not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with a front-gabled rectangular plan. The roof is covered with composition shingles and has moderately wide eaves. The formerly open eaves have been enclosed with vinyl material. The front elevation features a full-width porch with a canopy supported by an M-truss resting on wood posts, and knee braces. Exterior wall surfaces are clad with horizontal vinyl siding. The foundation is poured concrete. All windows are vinyl sash replacements and include both double-hung and sliding types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-21 DAHP No.

Historic Name: House at 3821 Freeman Road E

Common Name: Garner House

Property Address: 3821 Freeman Rd E, Fife, WA

Comments:

Tax No./Parcel No. 0420171035

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	17			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188163

Northing: 694091

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Charles and Brian Garner

Owner Address: 29811 Marine View Drive SW

City: Federal Way State: WA Zip: 98023-3422

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood - Vertical	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1946 Built Date
1963 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Belying this building's Ranch Style appearance, it was constructed in 1946, a very early date for that idiom. Perhaps it was given such a look during a 1963 remodel. Still, the shallow-pitched roof is unmistakably original, hinting at an earlier Prairie Style influence. Non-Ranch elements include the open eaves and the gabled front entry canopy. The vertical board siding appears to be a replacement of earlier materials. The house is abandoned and in deteriorating condition. Despite good integrity of its historic appearance, this residence does not possess sufficient distinction for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with an attached garage that projects forward, creating an L-shaped plan. The shallow-pitched, hipped roof is covered with composition shingles and has widely-overhanging, open eaves. A brick chimney emerges from near the roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with vertical board siding. The front entry to the house is beneath a gabled canopy supported by square wood posts. Visible windows are wood sash and include both picture and casement units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
West (front) and north elevations
2015



View to the northeast
West (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-22 DAHP No.

Historic Name: House at 4403 Freeman Road E

Common Name: Boitano House

Property Address: 4403 Freeman Rd E, Puyallup, WA 98371-0024

Comments:

Tax No./Parcel No. 0420174023

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188239

Northing: 692075

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Sharon Boitano

Owner Address: P.O. Box 224

City: Puyallup State: WA Zip: 98371-0024

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Brick - Common Bond	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1953 Built Date
1969 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1953. It is an early example of the Ranch Style, which would gain in popularity in the decade to come. Classic elements present are the shallow-pitched roof with widely-overhanging, enclosed eaves, the massive masonry chimney, and the attached garage. The brick header sills and the brick planter are common elements of the brick version of the Ranch Style. The metal sash units of the smaller windows are probably not original. Nevertheless, there is enough integrity of historic appearance and original construction materials to make this house a good candidate for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story building with a rectangular plan that includes an attached garaged in the rear space. The shallow-pitched, hipped roof is covered with composition shingles and has widely-overhanging enclosed eaves. A massive brick chimney, with three pots, is situated on the south slope, while a smaller brick chimney is located on the back slope. Exterior wall surfaces are clad with brick. The foundation is poured concrete. The left side of the front facade is recessed beneath the roof. The front entry is placed to the right of this recess. The wood panel front door is approached by rounded concrete steps. Large wood sash picture windows are located on the west (front) and south elevations. Other window are metal sash sliding units, except for a unique glass block window on the north elevation. All windows feature brick header sills. Another brick component is a planter along the right side of the facade.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2015



View to the southeast
West (front) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-23 DAHP No.

Historic Name: House at 4407 Freeman Road E

Common Name: Robert and Teresa Smith House

Property Address: 4407 Freeman Rd E, Puyallup, WA 98371-2449

Comments:

Tax No./Parcel No. 0420174033

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188216

Northing: 691954

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Robert and Teresa Smith

Owner Address: 4407 Freeman Road E

City: Puyallup State: WA Zip: 98371-2449

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1945 Built Date
1965 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence is a modest example of the World War II Cottage Style, aptly constructed in 1945, the year the war ended. The style is presented in the small scale, the simple box-like shape, and the short eaves. It appears that some of the windows and all of the siding are replacement materials. This residence is not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with an L-shaped plan consisting of the side gable portion and a gabled extension to the rear. The moderately-pitched roof is covered with composition shingles and has short, open eaves. Exterior wall surfaces are clad with horizontal wood siding. The foundation is concrete block. Most windows are covered, but those that are visible are metal sash sliding units. The central front entry contains a newer metal door.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
West (front) and north elevations
2015



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-24 DAHP No.

Historic Name: House at 8319 Valley Avenue E

Common Name: Worden House

Property Address: 8319 Valley Way E, Puyallup, WA 98511

Comments:

Tax No./Parcel No. 0420174044

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	17			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188713

Northing: 693375

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/22/2015

Field Recorder: S. Emerson

Owner's Name: Douglas and Sharon Worden

Owner Address: 8319 Valley Avenue E

City: Puyallup State: WA Zip: 98371-2510

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Concrete/Asbestos Wood - Vertical	Gable - Side Gable	Wood - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Architecture/Landscape Architecture

Other

Date of Construction:
1961 Built Date
1973 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence with detached garage was built in 1961 and remodeled in 1973. The shallow-pitched roof and rather wide eaves places it in the Ranch Style category, but otherwise it has a vernacular appearance. The variety of the exterior cladding is fanciful, but bespeaks of considerable alteration of materials. Although interesting enough in appearance, it does not display sufficient distinction to be considered eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This property consists of a 1-story wood frame house and a detached garage. The rectangular house has a shallow-pitched side-gable roof covered with wood shingles. The moderately-wide, open eaves feature scalloped fascia boards in the gables. Exterior walls are clad with a variety of materials, including vertical boards on the west side, horizontal wood siding in the gable faces, and asbestos shingles on the rest of the house. These shingles are cut into a variety of pieces and placed in such a way as to accomplish a rustic appearance. The foundation is poured concrete. A shed-roofed entry vestibule is attached to the west side. Windows of the house are metal sash sliding and fixed units. The two car garage/shop also has vertical board siding and a wood shingle roof, with horizontal wood siding in the gable face. Two vehicle entries do not appear to have doors, while a pedestrian entry contains a wood panel and glass door.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) elevation
2015



View to the west
Garage, east elevation
2015



View to the northeast
West elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-25 DAHP No.

Historic Name: Commercial Property at 8719 42nd Ct. E

Common Name: Castan Property

Property Address: 8719 42nd Ct E, Puyallup, WA

Comments:

Tax No./Parcel No. 04201163052

Plat/Block/Lot

Acreage about one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1189545

Northing: 693019

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Darth and Andrea Castan

Owner Address: 4701 116th Avenue E

City: Edgewood State: WA Zip: 98371-2304

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Commerce/Trade - Business
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Extensive
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Shingle - Combed	Gable - Cross Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Cross Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1960 Built Date
1970 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This former residence is a vernacular design that bears some resemblance to the Minimal Traditional Style, with its boxy shape, gabled extensions, and short, enclosed eaves. All of the windows have been replaced with modern units, precluding National Register of Historic Places eligibility for this building.

Description of Physical Appearance: The primary building is a former residence converted to commercial use. It is a 1-1/2 story wood frame building with a cross-gable plan. The roof is covered with composition shingles and has abrupt, enclosed eaves. Exterior walls are clad with combed wood shingles. The foundation is poured concrete. All original windows have been replaced with vinyl sliding units. There are several other buildings on the property. Among them are a wood frame well house, and at least four modern metal-clad sheds.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
Metal shed, west elevation
2015



View to the northeast
House, south (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-26 DAHP No.

Historic Name: Clover Leaf Farm

Common Name: Uchida Farm

Property Address: 4119 90th Ave E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420163074

Plat/Block/Lot

Acreage

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1190084

Northing: 692734

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Uchida Farm LLC

Owner Address: 8819 Valley Avenue E

City: Puyallup State: WA Zip: 98371-2535

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Architecture/Landscape Architecture
Agriculture

Other

Date of Construction:
1950 Remodel
1900 Built Date

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This property contains elements of agricultural structures as well as commercial/industrial structures. The oldest components were once part of a farm. This includes the house, the chicken barn, and the partially obscured structure, possibly a barn, at the center of the brick building complex. These agricultural elements date to 1900. The brick structures date to 1947 and are described as a storage warehouse and an office building. At this point it is not clear what function the brick structures once served, and they appear to have been abandoned long ago. Real estate records indicate that agricultural use occurred both before and after 1947. The names Clover Leaf Farms and Uchida Farm are mentioned in the records, but not explained. The house is still occupied, probably a rental. Other than that, only some of the vehicle garages appear to be in use. Both the agricultural components and the commercial components of this property are incomplete and suffer from a lack of maintenance and architectural integrity. Therefore, this complex of buildings is not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance:	This property contains a complex of buildings arranged in a hodgepodge of configurations. Standing alone are the house and the chicken barn. The largest configuration is a brick structure built around a wood frame barn. These are in addition to two vehicle garage groups. The house, located at the north central segment of the property, is a 1-story wood frame building with a semi-rectangular plan. The roof has short abrupt eaves and is covered with composition shingles. A full-height exterior brick chimney is attached to the west elevation. A gabled wall dormer and a shed-roofed dormer are situated on the east roof slope. A short gabled extension is attached to the south side. The front entry is placed on the east elevation, beneath a gabled porch canopy. Exterior wall surfaces are clad with horizontal wood siding. The foundation is poured concrete. The windows are metal sash and include sliding and double-hung units. The chicken barn is located in the southwest segment of the property. It is a wood frame 1-story structure with a long, narrow rectangular plan. The corrugated metal of the roof is placed over wood shingles. The moderately-wide eaves feature exposed rafter ends. A small wood frame, gabled cupola is situated on the roof crest. Exterior wall surfaces are clad with wood plank siding. Most fenestration is boarded over, but at least one fixed wood sash window, without glass, is visible. The largest structure is near the center of the property. It appears to be an industrial and commercial structure built around a wood frame building, perhaps a barn. Only the gable peak and a small ventilation cupola is visible. The rest of the building is flat-roofed. The gray bricks appear to enclose warehouse space for the most part. There are large circular openings with circular brick rowlocks that are bricked in. Fenestration in this portion of the building is limited to several roll-up metal vehicle doors and some glass block windows. The south portion of the brick building is 2 stories high and appears to have once contained office space. Windows of the south elevation are wood sash double-hung units. On the west elevation are two large metal sash picture windows. Flanking the lower window, at the corners, are glass block windows. Between the chicken barn and the brick building is a long, wood frame structure with a row of vehicle entry doors, of varying materials, facing east. Another configuration of vehicle storage structures, with both gabled and barrel vault roofs, is located in the northeast segment of the property. They have metal roofs and metal exterior cladding. Several vehicle entry doors are roll-up metal types. In general, this property is strewn with discarded items, including many tires, agricultural equipment, and construction materials.
Major Bibliographic References:	Yamamoto, Christopher, and Stephen Emerson. 2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
Chicken barn, west elevation
2015



View to the east
Overview
2015



View to the northeast
Metal vehicle garage, west elevation
2015



View to the northwest
Wood frame vehicle garage, east elevation
2015



View to the northeast
Brick building, offices, west elevation
2015



View to the southeast
Brick building, west elevation
2015



View to the northwest
House, east (front) and south elevation
2015



View to the northwest
Overview
2015



View to the southeast



View to the northeast

Brick building, west elevation
2015

Office building, west and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-27 DAHP No.

Historic Name: House and farm at 4411 90th Avenue E

Common Name: Cerqui Farm

Property Address: 4411 90th Ave E, Edgewood, WA 98371-2555

Comments:

Tax No./Parcel No. 0420163074

Plat/Block/Lot

Acreage Ca. 10

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1190769

Northing: 692162

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Louie Cerqui

Owner Address: 4321 90th Avenue E

City: Edgewood State: WA Zip: 98371-2555

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Agriculture/Subsistence - Farmstead
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Slight
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Colonial - Dutch Colonial	Wood - Clapboard Shingle - Coursed	Gambrel	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit	Other
Architecture/Landscape Architecture Agriculture	

Date of Construction: 1935 Built Date
1960 Remodel
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The three oldest buildings, the dairy barn, the milk house, and the farm house were constructed in 1935, the smaller barn was built at a later date, while the modern metal-clad buildings are much more recent. The house is a good example of a Dutch Colonial home, seen in the gambrel roof, bell cast eaves with exposed rafter ends, and the shed-roofed wall dormers. The Dutch Colonial look is reflected in the gambrel roof of the smaller barn. The older buildings on this property are classic elements of a once-active dairy farm. The other buildings are more modern in appearance and occupy more space, detracting from the property's integrity as an intact dairy farm. The surrounding grazing land has been converted to row crops, and there no longer appears to be any farm animals. Although some elements of a classic dairy farm are present, modern infill now dominates, the functions have changed, and the look and character of a dairy farm is diminished, leaving this property ineligible for placement on the National Register of Historic Places.

Description of Physical Appearance:	This property contains several older agricultural-associated buildings, including the farm house, a large dairy barn with attached milk house, and a smaller barn, as well as three large modern buildings. The house is a 1 1/2-story wood frame building with a rectangular plan. The gambrel roof is covered with composition shingles and features wide, bellcast eaves with exposed rafter ends. A brick chimney emerges from the central peak. There are three wall dormers with shed roofs and exposed rafter ends, two on the south slope and one on the north slope. Exterior wall surfaces of the dormers and the gable faces are clad with coursed wood shingles, while the primary lower walls are clad with narrow horizontal clapboard siding. The foundation is poured concrete. A simple uncovered wood deck precedes the front entry on the south elevation. The windows are a mix of old and new, including both wood sash and vinyl sash of fixed and double-hung types. The large dairy barn has a front gabled roof with prominent hay hood projecting from the south (front) elevation. The roof is covered with corrugated metal. Attached to the barn are two 1-story extensions, one with a hipped roof, to the north, and the other with a shed roof, to the west. Exterior wall surfaces are clad with wood planks and vertical board. Fenestration includes a large swinging hay loft door beneath the hood, a sliding vehicle door below that, several swinging pedestrian doors, and a few wood sash casement windows. The gabled milk house is separate from the dairy barn, but attached at the roof, forming a narrow breeze-way. The metal-clad roof has moderately-wide, open eaves. The foundation is poured concrete. Exterior walls are clad with horizontal wood plank siding with corner boards. Some windows are covered, visible windows appear to be fixed wood sash. The other barn is smaller in scale. It is a wood frame structure with a rectangular plan and a gambrel roof with bell-cast eaves and exposed rafter ends. The roof is covered with composition shingles. The foundation is poured concrete. Exterior walls are clad with wood boards. Windows are multiple-pane, fixed wood sash. The modern buildings on the property are large gabled structures with metal walls and roofs, with large vehicle entry doors.
Major Bibliographic References:	Yamamoto, Christopher, and Stephen Emerson. 2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
Milk shed, west and south elevations
2015



View to southeast
House, north and west elevation
2015



View to the east
Modern outbuildings
2015



View to the northeast
House, south (front) and west elevations
2015



View to the northeast
Small barn, west and south elevations
2015



View to the northeast
Dairy barn, south elevation
2015



View to the southeast
Dairy barn, north (rear) elevation
2015



View to the northeast
Modern outbuildings
2015

Historic Inventory Report

Location

Field Site No. SR167-28 DAHP No.

Historic Name: House at 4211 90th Avenue E

Common Name: Sahei Uchida House 1

Property Address: 4211 90th Ave E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420163047

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1190835

Northing: 692775

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Sahei Uchida

Owner Address: 15402 Elm Street E

City: Sumner State: WA Zip: 98390-2742

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1956 Built Date
1970 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1956, when the Ranch Style was gaining in prominence. Typical features found in the building include the shallow-pitched hip roof, the wide enclosed eaves, the masonry chimney, and the attached garage. Although a good and typical example of a mid-1950s Rancher, vinyl windows detract from its integrity, and it is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story, wood frame building with a mostly rectangular plan. An attached garage projects slightly at the right end of the building. The shallow-pitched, hipped roof is covered with composition shingles and has widely-overhanging, enclosed eaves. A brick chimney emerges near the crest of the roof. Exterior wall surfaces are clad with horizontal wood siding with corner boards. The foundation is poured concrete. Garage has a roll up metal door. A wood panel front door is situated near the center. All windows are vinyl sash and include picture and casement units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-29 DAHP No.

Historic Name: House at 4119 90th Avenue E

Common Name: Uchida Farm House 1

Property Address: 4119 90th Ave E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420163026

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1190832

Northing: 693167

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Uchida Farm LLC

Owner Address: 8819 Valley Avenue E

City: Puyallup State: WA Zip: 98371-2535

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Cross/Cruciform
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Veneer - Vinyl Siding	Gable - Cross Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Cross Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1900 Built Date
1950 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence is an old farm house, built in 1900. It was modified in 1950. It displays no particular style, best described as a vernacular design. The concrete block foundation is an indicator that it was either moved or raised. The wholesale replacement of original siding and window renders this building ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1 1/2-story wood frame building with a cruciform plan, with gables facing west, north, and south, and a shed-roofed portion to the east. It is situated on a slope, and a daylight basement level occupies the south side. The roof is covered with composition shingles and has moderately-wide, open eaves. A full-height, exterior brick chimney is attached to the north elevation. Exterior wall surfaces are clad with horizontal vinyl siding with corner boards. The foundation is concrete block. A hip-roofed, enclosed porch is situated on the north elevation. All windows are vinyl sash and include fixed and double -hung units. Behind the house is a wood frame front-gabled garage. The roof is covered with composition shingles and has exposed rafter ends. It has wood clapboard siding.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
North and west elevations
2015



View to the northeast
South elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-30 DAHP No.

Historic Name: House at 4608 86th Avenue E

Common Name: Ogle House

Property Address: 4608 86th Ave E, Puyallup, WA 98371-2588

Comments:

Tax No./Parcel No. 0420174050

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	17			Pierce	PUYALLUP

Coordinate Reference

Easting: 1189296

Northing: 691435

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Annalee Ogle

Owner Address: 33013 210the Avenue SE

City: Auburn State: WA Zip: 98092-7603

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1928 Built Date
1986 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1928 and remodeled in 1986. Extensive renovations have given the building a thoroughly modern appearance. The only remnant of the original 1928 building is the brick chimney. None of the fenestration is original. All of the windows are vinyl sash. The siding has recently been replaced. The cedar deck is a very recent addition, missing from Google Street View, which also depicts older wood front entry and garage doors. Due to such extensive alterations, this house is certainly not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This structure is a 1-story, wood frame building with a rectangular plan consisting of a side-gabled house and an attached side-gabled garage. The roof is covered with composition shingles and has very short eaves that are enclosed. An older brick chimney emerges from near the roof crest. Exterior wall surfaces are clad with wide horizontal wood siding with corner boards. The foundation is poured concrete. A full-width, under-the-roof front porch canopy is supported by four wood posts. Below the canopy is a recently-installed cedar deck. The front entry door is placed to the right, while a canted bay window is placed to the left. Windows are all vinyl sash and include fixed picture types and sliding types. The two garage doors are modern metal roll-ups.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the northwest
East (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-31 DAHP No.

Historic Name: House at 4522 86th Avenue E

Common Name: Simmons House

Property Address: 4522 86th Ave E, Puyallup, WA 98371-2588

Comments:

Tax No./Parcel No. 0420174021

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	17			Pierce	PUYALLUP

Coordinate Reference

Easting: 1189292

Northing: 691566

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Robert Simmons Jr.

Owner Address: 4522 86th Avenue E

City: Puyallup State: WA Zip: 98371-2588

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Veneer - Vinyl Siding	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1958 Built Date
1975 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house and attached garage was built in 1958, as the Ranch Style was reaching a crescendo of popularity. Classic elements of the style present in this building include the horizontal profile, the shallow -pitched roof, the widely-overhanging enclosed eaves, the massive masonry chimney, and the attached garage. Although this residence retains good integrity of its historic appearance, the wholesale replacement of original construction materials, including siding and fenestration, precludes National Register of Historic Places eligibility for this building.

Description of Physical Appearance: This residence is a 1-story wood frame structure with a rectangular plan, including an attached garage. The shallow-pitched hipped roof is covered with composition shingles and has widely-overhanging enclosed eaves. A large brick chimney with a rectangular cross-section emerges from near the right roof crest. Exterior wall surfaces are clad with horizontal vinyl siding with corner boards. The foundation is poured concrete. The front door is recessed within a central alcove, the walls of which are clad with brick. At the right end, the garage door is a metal roll-up type. All of the windows are vinyl sash replacements and include both fixed picture and sliding types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northwest
East (front) and south elevations
2015



View to the southwest
East (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-32 DAHP No.

Historic Name: House at 5822 108th Avenue Ct E

Common Name: Jascur House

Property Address: 5822 108th AvCt E, Puyallup, WA 98372-4627

Comments:

Tax No./Parcel No. 2245000311

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196666

Northing: 687257

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Sally Jascur

Owner Address: 1922 7th Street SE

City: Puyallup State: WA Zip: 98372-4627

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 1 1/2

Structural System: Platform Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Combed	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1950 Built Date

1967 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance:

This house was built in 1950 and remodeled in 1967. The house does not exhibit any particular architectural style and would best be described as vernacular. The house retains good integrity of its historic appearance and fair integrity of original construction materials. The replacement of all windows with metal sash units, however, disqualifies it from National Register of Historic Places eligibility.

Description of Physical Appearance:

This residence is a 1 1/2-story wood frame building with a rectangular plan. The front-gabled roof is covered with composition shingles and has moderately-wide enclosed eaves. A large chimney with a rectangular cross-section emerges from the south slope of the roof. Exterior wall surfaces are clad with combed wood shingles. The foundation is poured concrete. A wood panel front door is centered beneath a gabled canopy supported by two metal posts. All of the windows are metal sash and include both fixed picture and sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the west
East (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-33 DAHP No.

Historic Name: Duplex at 5819 108th Avenue Ct E

Common Name: Coral/Ragubathi House

Property Address: 5819 108th AvCt E, Puyallup, WA 98198-3016

Comments:

Tax No./Parcel No. 2245000510

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	27			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196839

Northing: 687222

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Edward Coral and Karthigesu Ragubathi

Owner Address: 21304 3rd Avenue S

City: Des Moines State: WA Zip: 98198-3016

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Multiple Family House
Current Use: Domestic - Multiple Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Veneer - Stucco	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Multi-Family - Duplex

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1944 Built Date
1965 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This duplex was built in 1944 and remodeled in 1965. It has many attributes of the Ranch Style, including the horizontal profile and the shallow-pitched hipped roof with wide enclosed eaves. But 1944 seems a bit early for a Ranch House, so much of its current appearance may have been the result of later alterations. What ever the extent of renovations, such as replacing original windows with vinyl sash units, they disqualify this building from National Register of Historic Places eligibility.

Description of Physical Appearance: This building is a 1-story wood frame duplex with a rectangular plan. The shallow-pitched hipped roof has widely-overhanging enclosed eaves. It is covered with composition shingles. Exterior wall surfaces have a stucco cladding. The foundation is poured concrete. At the center of the front is a recessed alcove with entry doors placed at each end. All windows are sliding vinyl sash types, several of which are flanked by faux shutters.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
West (front) elevation
2015



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-34 DAHP No.

Historic Name: House at 10825 58th Street Ct. E

Common Name: Allen House

Property Address: 10825 58th StCt E, Puyallup, WA 98372-2732

Comments:

Tax No./Parcel No. 2245000520

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196882

Northing: 687212

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Michael Allen

Owner Address: 10825 58th Street Ct. E

City: Puyallup State: WA Zip: 98372-2732

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Shingle - Combed	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1945 Built Date
1965 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1945 and remodeled in 1965. Its modest appearance and date of construction place it in the World War II Cottage classification, but its shallow-pitched roof make it a transitional step to the Ranch Style, which would gain prominence in the 1950s. The combed wood siding is probably original but all of the windows have been replaced by vinyl sash sliders, eliminating the possibility of National Register of Historic Places eligibility.

Description of Physical Appearance: This residence is a 1-story wood frame building with a rectangular plan. The side-gabled, shallow-pitched roof is covered with composition shingles and has moderately-wide, unenclosed eaves. Exterior wall surfaces are clad with combed wood shingle siding. The foundation is poured concrete. A wood panel front door is placed at the far right side of the west (front) elevation. All windows are vinyl sash sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. AR167-35 DAHP No.

Historic Name: Duplex at 10917 58th Street Ct. E

Common Name: Mathews House

Property Address: 10917 58th Street StCt E, Puyallup, WA

Comments:

Tax No./Parcel No. 2245000410

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196976

Northing: 687159

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Estate of Doris Mathews

Owner Address: 601 9th Street NW

City: Puyallup State: WA Zip: 98371-4203

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Multiple Family House
Current Use: Domestic - Multiple Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Combed Wood - Vertical	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Multi-Family - Duplex

Narrative

Study Unit
Architecture/Landscape Architecture

Other

Date of Construction:
1956 Built Date
1970 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance:
This house was built in 1956, as the Ranch Style was rapidly gaining in popularity, and remodeled in 1970. Diagnostic stylistic features present include the shallow-pitched roof with wide enclosed eaves, and the horizontal profile. As an example of the style it has fair integrity, but the wholesale replacement of all historic fenestration with modern materials renders this building ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance:
This duplex is a 1-story wood frame building with a rectangular plan. The shallow-pitched, hipped roof is covered with composition shingles and has widely-overhanging enclosed eaves. At either end is a combination enclosed garage and carport. Exterior wall surfaces are a combination of combed shingles and vertical board. The foundation is poured concrete. All original windows have been replaced with vinyl sash picture and sliding types.

Major Bibliographic References:
Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-36 DAHP No.

Historic Name: House at 11003 58th Street Ct. E

Common Name: Mathews House 2

Property Address: 11003 58th StCt E, Puyallup, WA

Comments:

Tax No./Parcel No. 7705000191

Plat/Block/Lot

Acreage 3

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197267

Northing: 687014

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Estate of Doris Mathews

Owner Address: 601 9th Street NW

City: Puyallup State: WA Zip: 98371-4203

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: Rectangle
Stories: 2
Structural System: Platform Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Concrete/Asbestos	Gable - Cross Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Multi-Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1930 Built Date
1957 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This former single-family residence was converted to multiple tenant use before recently becoming vacant. It was built in 1930 and remodeled in 1957. It reflects no particular style and is best described as vernacular. The windows and gable faces are relatively intact, but most exterior walls have been covered with asbestos panel siding, rendering this building ineligible for listing on the National Register of Historic Places. The garage is a common place structure and is ineligible as well.

Description of Physical Appearance: This building is a 2-story wood frame house with a rectangular plan. The main portion is flanked at each end by 1-story hip-roofed extensions. The cross-gable primary roof is covered with composition shingles and features wide, enclosed eaves and bellcast gables. Two brick chimneys emerge from the roof crest. The gables are clad with horizontal clapboard siding, with the apex clad with diamond shingle imbrication. Other exterior wall surfaces are clad with asbestos panel siding. The foundation is poured concrete. Multiple front entries are centered on the north elevation, beneath a gabled canopy supported by wood posts. Many of the windows are boarded over; those that aren't appear to be wood sash fixed and double-hung units. East of the house is a detached garage/shop with gabled and shed roofs. The roof is clad with composition shingles and features exposed rafter ends. The siding is horizontal clapboard. Entry doors include sliding and swinging types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
House, north (front) elevation, and garage
2015



View to the southeast
North (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-37 DAHP No.

Historic Name: House at 6007 Milwaukee Avenue E

Common Name: Ramage House

Property Address: 6007 Milwaukee Ave E, Puyallup, WA 98372-2751

Comments:

Tax No./Parcel No. 7705000252

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197086

Northing: 686666

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Melinda and Scott Ramage

Owner Address: 6007 Milwaukee Avenue E

City: Puyallup State: WA Zip: 98372-2751

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Slight
Changes to Windows: Intact
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1928 Built Date
1956 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1928, as the Craftsman Style was gaining in popularity. Diagnostic elements present include exposed rafter ends and purlins in the open eaves, and the large front porch canopy with masonry piers and battered posts. Some siding of the front porch was missing at the time of survey but is being replaced with appropriate materials. This is the only sign of diminished architectural integrity. The fact that all of the wood sash windows are present, in an area of residential neighborhoods where almost all original windows have been removed, makes this house a good candidate for National Register of Historic Places eligibility.

Description of Physical Appearance: This residence is a 1 1/2-story wood frame building with a rectangular plan. The side-gabled roof is covered with composition shingles and has moderately-wide, open eaves that feature exposed rafter ends and purlins. A brick chimney emerges from the back roof slope. Exterior wall surfaces are clad with horizontal clapboard siding. The foundation is poured concrete. All windows are wood sash and include fixed and double-hung units, some with multiple panes. The wood panel and glass front door is centered beneath a wide gabled canopy supported by battered wood posts resting on piers clad with stone veneer. At the rear of the house is an enclosed back porch with a gabled roof. Behind the house is a modern, metal-clad garage.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the south
North elevation
2015



View to the northeast
South elevation
2015



West (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-38 DAHP No.

Historic Name: House at 6008 Milwaukee Avenue E

Common Name: Van Meveren House

Property Address: 6008 Milwaukee Ave E, Puyallup, WA 98372-2750

Comments:

Tax No./Parcel No. 0420223068

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196846

Northing: 686682

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: George and Rose Van Meveren

Owner Address: 6008 Milwaukee Avenue E

City: Puyallup State: WA Zip: 98372-2750

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 2
Structural System: Platform Frame
Changes to Plan: Extensive
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Wood - Shiplap	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1914 Built Date
1950 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1914, marking it as a remnant of a long vanished neighborhood. It was remodeled in 1950 and several more times more recently. These extensive renovations have resulted in a building that probably bears no resemblance to the original. The Craftsman Style architectural features, like the wide eaves, exposed rafter ends, and knee braces, are later additions, as is probably the siding itself. All of these alterations render this building ineligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a 2-story wood frame building with a rectangular plan. The front-gabled roof is covered with composition shingles and features widely-overhanging, open eaves exposed rafter ends, fascia boards, and knee braces in the gables. A brick chimney emerges from the south roof slope. Exterior wall surfaces are clad with horizontal ship lap siding with corner boards. The foundation is poured concrete. Enclosed gabled porches are attached to the east (front) and north elevations. Windows are vinyl sash and include fixed and double-hung units. There is a vinyl sash octagonal window on the north elevation. Several gabled wood frame sheds are located behind the house.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the south
North elevation and sheds
2015



View to the northwest
East (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-39 DAHP No.

Historic Name: House at 6014 Milwaukee Avenue E

Common Name: Worthington House

Property Address: 6014 Milwaukee Ave E, Puyallup, WA 98372-2750

Comments:

Tax No./Parcel No. 0420223023

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196843

Northing: 686630

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/23/2015

Field Recorder: S. Emerson

Owner's Name: Paddy and Heidi Worthington

Owner Address: 6014 Milwaukee Avenue E

City: Puyallup State: WA Zip: 98372-2750

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular Arts & Crafts - Craftsman	Wood	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1910 Built Date
1965 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1910 but has a much more modern appearance due to extensive renovations, some of which apparently occurred in 1965. It is an altered survivor of an old neighborhood marginalized by highway construction and modern development. The wide, open eaves and exposed rafter eaves give it a somewhat Craftsman Style appearance, but it is best described as a vernacular design. The wholesale replacement of windows and siding with modern materials renders this house ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with a rectangular plan. The front-gabled roof has an asymmetrical pitch and features wide, open eaves with exposed rafter ends and fascia boards. Exterior wall surfaces are clad with horizontal wood siding, with a faux-wood grain finish, and corner boards. The foundation is poured concrete. A front porch with a gabled canopy is partially enclosed by siding-clad half walls. A modern gabled garage is present behind the house.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the west
East (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-40 DAHP No.

Historic Name: House at 6020 Milwaukee Avenue E

Common Name: Whittington House

Property Address: 6020 Milwaukee Ave E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420223098

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1196786

Northing: 686541

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 10/13/2015

Field Recorder: S. Emerson

Owner's Name: Nathan and Jorden Whittington

Owner Address: 312 16th Street NW

City: Puyallup State: WA Zip: 98371-5236

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1 1/2
Structural System: Platform Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Intact
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Wood - Clapboard	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1925 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1925 and is an excellent example of the classic Craftsman Style house. Diagnostic features present include the wide, open eaves with exposed rafter ends, fascia boards, and exposed purlins, massive exterior masonry chimney flanked by inglenook windows, the full-width front porch with battered posts and brick piers, and the tripartite window of the front. All architectural elements of the exterior appear to be original, making it one of most intact Craftsman Style houses in the Puyallup Valley. It is certainly eligible for placement on the National Register of Historic Places.

Description of Physical Appearance:	This house is a 1 1/2-story wood frame building with a rectangular plan. The front-gabled roof is covered with composition shingles and features widely-overhanging, open eaves with exposed rafter ends, fascia boards, and exposed purlins in sets of three, staggered in length. A brick chimney emerges from the roof crest near the rear. Another chimney is located on the south elevation and is a full-height brick structure, corbeled near the top and penetrating the eave. A shed-roofed dormer is situated on the north roof slope. A gabled bay window is situated near the center of the south elevation. Exterior wall surfaces are clad with narrow horizontal clapboard siding. The foundation is poured concrete. A full-width, under-the-roof front porch is anchored at the corners by battered wood posts resting on brick piers. A wood railing defines the wood porch deck, while poured concrete steps are flanked by brick half-walls. The left portion of the porch contains a wood and glass entry door flanked by multiple-pane wood sash side lights. The right half of the porch contains a Craftsman Style tripartite window with wood sash, multiple-pane upper sections. Other windows are all wood sash as well and include both sliding, double-hung and, in the front gable face, casement units. Flanking the exterior chimney are small fixed wood sash inglenook windows. Flower boxes are placed beneath some of the windows. An enclosed hip-roofed porch is attached to the rear of the house.
Major Bibliographic References:	Yamamoto, Christopher, and Stephen Emerson. 2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the northwest
East (front) and south elevations
2015



View to the north
Bay window on south elevation
2015



View to the west
East (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-41 DAHP No.

Historic Name: House at 6306 7th Street Ct E

Common Name: Nordhoff House

Property Address: 6306 7th StCt E, Fife, WA 98424-1476

Comments:

Tax No./Parcel No. 0420061136

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	POVERTY BAY

Coordinate Reference

Easting: 1182205

Northing: 704395

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: David And Eva Nordhoff

Owner Address: 6306 7th Street Ct E

City: Fife State: WA Zip: 98424-1476

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 1 1/2

Structural System: Braced Frame

Changes to Plan: Slight

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Moderate

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Brick - Clinker Shingle - Coursed	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Side Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1950 Built Date

1967 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1950 and remodeled in 1967. Although it represents no particular style, it does reflect some elements of the Minimal Traditional Style, such as the boxy shape and the short enclosed eaves. Although some windows are original, others are modern replacements. Other incompatible additions include the modern door and porch awning, diminishing the architectural integrity of its historic appearance and precluding National Register eligibility.

Description of Physical Appearance:	This residence is a wood frame building with a primary 2-story central portion flanked by 1-story extensions, forming a side-gabled plan, with the front entry situated in the north extension. A saltbox profile accommodates second-floor windows facing west. The roof is covered with composition shingles and has short, enclosed eaves. The foundation is concrete block. Exterior wall surfaces are clad with common bond, clinker brick veneer, in the primary walls, and coursed wood shingles in the gable faces and the second-story wall. Windows include fixed, double-hung, and sliding types, employing mostly wood sashes, but some metal sashes as well. Each elevation presents a unique appearance. The east (front) elevation features a canted bay window and a large double-hung window, in the main wall, with the front entry in the north extension and a rear entry in the south extension. The west elevation showcases several architectural features, including a full-height, exterior brick chimney, sliding windows on the upper level, large picture windows below, and an open porch enclosed with brick half-walls. A long, detached side-gabled garage/shop is situated just southeast of the house. It has a composition roof with short, enclosed eaves. Exterior wall surfaces are clad with board and batten siding. The interior is accessed by two wood roll-up vehicle doors
Major Bibliographic References:	Yamamoto, Christopher, Stephen Emerson, and Rebecca Stevens 2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
East (front) and north elevations
2015



View to the south
Garage/shed, north elevation
2015



View to the southeast
West and north elevations
2015



View to the northwest
South elevation
2015



View to the northeast
west and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-42 DAHP No.

Historic Name: Joe Young Cabin

Common Name: Erickson House

Property Address: 860 64th Ave E, Fife, WA

Comments:

Tax No./Parcel No. 0420064086

Plat/Block/Lot

Acreage

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	06			Pierce	PUYALLUP

Coordinate Reference

Easting: 1182245

Northing: 704180

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Elaine Ericikson

Owner Address: 1426 Frontero Avenue

City: Los Altos State: CA Zip: 94024-5915

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Other
Plan: Rectangle
Stories: 1
Structural System: Log
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Moderate
Changes to Windows: Not Applicable
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Log	Gable - Front Gable	Wood

Foundation:	Form/Type:
None	Single Family - Log

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1900 Built Date
Builder: Joe Young
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: Yes
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance:

Puyallup tribal member Joe Young is associated with Puyallup Reservation allotment 174 which corresponds to the cabin and Erickson house location (Smith 1940:46, 330). Born in 1863, he provided Puget Sound ethnographic information to Arthur C. Ballard (1929:40). The Joe Young cabin is a classic example of Native American residential architecture as influenced by the Hudson's Bay Company; the fur trading venture operated at Fort Nisqually, where Joe Young's father was employed (Ballard 1929:40). This cabin was built in about 1900 after an older cabin on the property was destroyed in a fire (Kristine Erickson, property resident, personal communication 2015). The V-notched construction was a commonly used technique for joining corners. The plywood roof is a later addition, but is likely instrumental in the successful preservation of the cabin itself. Probably not long after construction of the cabin, Joe Young sold his land and moved on. Likely, some of his descendants are on the rolls of the Puyallup Tribe. The cabin is eligible for inclusion in the NRHP under Criterion C, as a surviving example of early log cabin construction, and under Criterion A, for its association with Native American presence in the Fife area. The original portion of the Erickson House was probably built about a decade after the log cabin, and added onto over the years, with the southern portion being the oldest. Much of the fenestration has been updated using modern materials such as vinyl. Alterations have occurred to the garage/shed as well. The house and garage/shed do not contribute to the eligibility of the Joe Young cabin.

Description of Physical Appearance:	The Joe Young Cabin is a rectangular log structure measuring about 16 feet by 12 feet. The logs of the walls are peeled and quite large, with the largest at the bottom. The logs are V-notched at the corners. The only fenestration is a wood plank door on the north (front) elevation, with iron hinges. Slabs of plywood form the roof, attached to interior log purlins and rafters. The gabled roof projects forward from the front to form a canopy before the entry, supported by upright log posts. The foundation appears to be sill logs resting directly on the ground. The nearby Erickson House is a 1-story wood frame building with a U-shaped plan consisting of a side-gabled portion with projecting front-gabled extensions at each end. The roof is covered with composition shingles and has short enclosed eaves. A massive brick chimney emerges from the back slope of the roof. The foundation is poured concrete. Exterior wall surfaces are clad with combed wood shingle siding, except for the recessed wall between the two gabled projections, which is clad with brick. The windows are about half wood sash double-hung and sliding units and about half vinyl multiple pane units. Southeast of the house is a wood frame garage/shed consisting of a gabled portion and a shed-roof portion, side-by-side. The roof is covered with wood shingles and has open eaves. A hip-roofed ventilation cupola emerges from the central roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with board and batten siding. Fenestration includes sliding wood sash windows, a wood panel pedestrian door, and a lift-up vehicle door with multiple windows.
Major Bibliographic References:	Ballard, Arthur C. 1929 Mythology of Southern Puget Sound. University of Washington Press, Seattle. Smith, Marian W. 1940 The Puyallup-Nisqually. Columbia University Press, New York. Yamamoto, Christopher, and Stephen Emerson 2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Eastern Washington University, Cheney.

Photos



View to the southeast
Erickson House, east and south elevations
2016



View to the west
East (front) elevation
2016



View to the southwest
Joe Young Cabin, north (front) and east elevations
2016



View to the southeast
North and west elevations
2016



View to the southwest
Garage/shed, east and north elevations
2016

Historic Inventory Report

Location

Field Site No. SR167-43 DAHP No.

Historic Name: House at 2417 Freeman Road E

Common Name: City of Edgewood House 1

Property Address: 2417 Freeman Rd E, Edgewood, WA

Comments:

Tax No./Parcel No. 0420084019

Plat/Block/Lot

Acreage 2

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	08			Pierce	PUYALLUP

Coordinate Reference

Easting: 1187481

Northing: 698721

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: City of Edgewood

Owner Address: 2224 104th Avenue E

City: Edgewood State: WA Zip: 98372-1513

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Slight
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Wood - Clapboard Wood - Vertical	Saltbox Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1935 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This 1935 house and associated out-buildings appear to be the remnants of a former agricultural property, albeit on a small scale. The house exhibits no particular style and is abandoned. The out-buildings are in an advanced state of disrepair. The modest residence and its associated features do not possess sufficient distinction to warrant listing on the National Register of Historic Places.

Description of Physical Appearance: The house is a 1-story wood frame structure with a rectangular plan. The side-gabled, saltbox roof is covered with composition shingles and has short, unenclosed eaves. The foundation is concrete block. Exterior wall surfaces are clad with a skirt of wood clapboard siding beneath vertical boards. The central front entry is situated below a gabled canopy held by wrought iron supports. A hip-roofed carport canopy is present on the south side, supported by wood posts. Windows are all wood sash and include multiple horizontal panes in the front, some multiple fixed sash on other elevations, as well as double-hung types. Behind the house is a wood frame, gull-wing shed. It has wood plank siding and a corrugated metal roof. The west shed portion is open and the east portion is semi-enclosed. The collapsed remnants of smaller out-buildings are scattered throughout the property.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
Shed, west and south elevations
2015



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-44

DAHP No.

Historic Name: House at 7228 Valley Avenue E

Common Name: Boitano House 2

Property Address: 7228 Valley Ave E, Fife, WA

Comments:

Tax No./Parcel No. 0420172020

Plat/Block/Lot

Acreage 2

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	17			Pierce	PUYALLUP

Coordinate Reference

Easting: 1185247

Northing: 695083

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup

Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Boitano Bros Investment LLC

Owner Address: 7316 36th Street E

City: Fife State: WA Zip: 98424-3716

Classification: Building

Resource Status: Survey/Inventory

Comments:

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1 1/2
Structural System: Braced Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Combed	Gable - Front Gable	Metal - Standing Seam

Foundation:	Form/Type:
Unknown	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1960 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This modest vernacular house was, according to real estate records, built in 1960, but is likely older. A photograph from a 1982 inventory form indicates that it has been thoroughly renovated since that date, although the basic front-gabled building remains. Windows, siding, and the front porch have all been altered. These extensive changes preclude National Register of Historic Places eligibility for this building.

Description of Physical Appearance: This house is a 1 1/2-story wood frame cottage with an L-shaped plan created by juxtaposition of the main front-gabled portion and a 1-story flat-roofed extension to the south. The roof is covered with standing seam metal and has short, unenclosed eaves. The foundation is not visible. Exterior wall surfaces are clad with combed wood shingle siding. Windows include both fixed and double-hung and have wood sashes. A modern wood and glass, semi-enclosed front porch with supporting knee braces is attached to the front.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northwest
East (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-45 DAHP No.

Historic Name: House at 4815 Freeman Road E

Common Name: Galloway House

Property Address: 4815 Freeman Rd E, Puyallup, WA 98371-2525

Comments:

Tax No./Parcel No. 0420201066

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188067

Northing: 690768

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Mike and Gail Galloway

Owner Address: 4815 Freeman Road E

City: Puyallup State: WA Zip: 98371-2525

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 2

Structural System: Braced Frame

Changes to Plan: Extensive

Changes to Interior: Unknown

Changes to Original Cladding: Extensive

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Veneer - Vinyl Siding	Gable Flat with Eaves	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1945 Built Date

1970 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records indicate that this residence was built in 1945 and remodeled in 1970. It has clearly undergone extensive modifications. It is likely that the nearly-flat roof was part of a substantial addition, which possibly enlarged an originally front-gable structure. The windows and siding are certainly modern alterations. These changes render this house ineligible for placement on the National Register of Historic Places. The garage retains what is probably original siding, but it too is ineligible.

Description of Physical Appearance: This residence is a 2-story wood frame building with an L-shaped plan. The main section has a nearly flat roof. A gabled extension projecting forward from the main section forms the L. The roof is covered with composition shingles and has abrupt enclosed eaves. A brick chimney emerges from near the center of the main section. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl siding with corner boards. The front entry is situated in the crook formed by the L and has a shed-roofed canopy supported by wood posts on brick half-walls. Windows are mostly metal sash sliders, but also include some vinyl units, both fixed and double-hung. Southeast of the house is a front-gabled garage with a wide metal roll-up vehicle door. It has a composition shingle roof and combed wood shingle siding.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
west and north elevations
2015



View to the northeast
West and south elevations
2015



View to the northeast
House, west and south elevations, garage, west elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-46 DAHP No.

Historic Name: House at 4823 Freeman Road E

Common Name: O'Connor House

Property Address: 4823 Freeman Rd E, Puyallup, WA 98371-2525

Comments:

Tax No./Parcel No. 0420201034

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188067

Northing: 690675

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Ememrson

Owner's Name: Michael and Teresa O'Connor

Owner Address: 4823 Freeman Road E

City: Puyallup State: WA Zip: 98371-2525

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 1

Structural System: Braced Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1900 Built Date

1950 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance:

If real estate records are correct, this house was constructed in 1900. However, its World War II Cottage appearance is likely the result of a 1950 remodel. Architectural integrity is good except for a jarring exception: the replacement of all windows with modern vinyl materials. This eliminates the house from National Register of Historic Places consideration.

Description of Physical Appearance:

This house is a 1-story wood frame structure with a rectangular plan consisting of the main rectangular portion and a short extension to the south side. The roof has a somewhat steep pitch and is covered with composition shingles. The eaves are short and enclosed. A brick chimney emerges from near the central roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal wood clapboard with corner boards. The central front entry contains a wood panel door situated beneath as short gabled canopy. All windows appear to be either fixed or double-hung vinyl sash types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
West (front) elevation
2015



View to the northeast
West (front) and south elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-47 DAHP No.

Historic Name: House at 4827 Freeman Road E

Common Name: Conley House

Property Address: 4827 Freeman Rd E, Puyallup, WA 98371-6629

Comments:

Tax No./Parcel No. 0420201052

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188093

Northing: 690572

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Lawrence and Priscilla Conley

Owner Address: 8422 239th Street E

City: Graham State: WA Zip: 98338-9310

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood - Clapboard	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1948 Built Date
1966 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence was built in 1948, a relatively early date for a Ranch Style house. The Ranch appearance of the building may have been enhanced during a 1966 remodel, especially on the west elevation, where the typical massive masonry chimney is located. Other Ranch Style characteristics include the wide horizontal elevational profile, the attached garage, and the shallow-pitched roof with wide enclosed eaves. Primarily due to the replacement of all original windows with vinyl sash types this house is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a sprawling 1-story wood frame building that presents two primary facades, to the south and to the west, which can be called the front because that is where the main entry is located. The shallow-pitched hip roof is covered with composition shingles and has moderately-wide enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal wood siding with faux wood grain. The south elevation includes an attached two-car garage with a wide roll-up vehicle door, at the east end, several hip-roofed projections, and a secondary pedestrian door. The west elevation includes a massive exterior brick chimney that penetrates the eave completely, with a large brick wall accompaniment to the side. The front entry contains a wood and glass door that is recessed beneath wide eaves supported by wood posts. The entry is flanked by glass block sidelights. All windows of the house are modern vinyl sash units and include both fixed and double-hung types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
West (front) elevation
2015



View to the northwest
South elevation
2015

Historic Inventory Report

Location

Field Site No. SR267-48 DAHP No.

Historic Name: House at 4917 Freeman Road E

Common Name: Grelis House 1

Property Address: 4917 Freeman Rd E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420201045

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188093

Northing: 690414

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Dennis Grelis

Owner Address: 2123 Browns point Blvd

City: Tacoma State: WA Zip: 984222312

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Moderate
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Combed Wood - Vertical	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1900 Built Date
1955 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: According to real estate records, this house was built in 1900. Obviously major alterations have resulted in the current modern appearance. Overall, it has the look of the Ranch Style, with its horizontal elevational profile, shallow-pitched roof, and attached garage. The age of the building indicates that it has undergone changes to the cladding. Altogether, it is not a good representative of the Ranch Style and is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with a side-gabled, rectangular plan. The shallow-pitched roof is covered with composition shingles and has moderately-wide enclosed eaves along the lower sides and short enclosed eaves in the gables. A brick chimney emerges from near the roof crest. The foundation is poured concrete. Exterior wall surfaces of the horizontal elevations are clad with combed wood shingle siding, while the gable ends are clad with vertical board. A wide vehicle garage occupies the east end, with a roll-up vehicle door. Windows are wood sash and include both fixed and double-hung types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
West elevation
2016



View to the northeast
South and west elevations
2016



View to the southwest
North (front) and east elevations
2016

Historic Inventory Report

Location

Field Site No. SR167-49 DAHP No.

Historic Name: House at 8218 49th Street E

Common Name: Shadle House

Property Address: 8218 49th St E, Puyallup, WA 98371-2504

Comments:

Tax No./Parcel No. 0420201042

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188348

Northing: 690357

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Danny and Wendy Shadle

Owner Address: 8218 49th Street E

City: Puyallup State: WA Zip: 98371-2504

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Veneer - Vinyl Siding	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1954 Built Date
1969 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house is an excellent example of the Minimal Traditional Style. It was built in 1954, when that style was at the height of its popularity. Diagnostic elements include the boxy shape, the side gable plan with gabled front wing, the short enclosed eaves, and the massive brick chimney. Despite the remarkable retention of its historic appearance, the wholesale replacement of all windows and exterior cladding renders this building ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with a side-gabled plan and forward-projecting gabled extension. The roof is moderately-pitched and is covered with composition shingles. Eaves are abrupt and enclosed. On the left side of the projecting gabled extension is a cat slide roof that serves as a canopy for the front entry. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl drop siding. A full-height, exterior brick chimney is situated on the west elevation, piercing the eave. All windows are modern vinyl sash replacements and include both fixed and double-hung types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
North (front) and west elevations
2015



View to the southwest
North (front) and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-50 DAHP No.

Historic Name: House at 4923 Freeman Road E

Common Name: Grelis House 2

Property Address: 4917 Freeman Rd E, Puyallup, WA 98371-2523

Comments:

Tax No./Parcel No. 0420201045

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188113

Northing: 690321

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2105

Field Recorder: S. Emerson

Owner's Name: Dennis Grelis

Owner Address: 2132 Browns Point Blvd

City: Tacoma State: WA Zip: 98422-2312

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Irregular
Stories: 2
Structural System: Braced Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Coursed Veneer - Vinyl Siding	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1930 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records do not give the construction date of this residence. The 1930 date is just a guess. It appears that the house has undergone several major modifications. It may have originally been a simple front gable. These changes also make it hard to place it in a particular category as to architectural style, so I decided to just call it vernacular. Alterations render this house ineligible for National Register of Historic Places consideration.

Description of Physical Appearance: This house is a 2-story wood frame building with an unusual roof configuration consisting of a 2-story side gable, hipped at the south end, and a forward projecting 1-story front gable. The roof is covered with composition shingles and has moderately-wide enclosed eaves. A brick chimney emerges from the rear crest of the front gable section. A wall dormer facing west, with a horizontal window, barely raises its roof above that of the main roof. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl siding, except for the face of the front gable portion which retains coursed wood shingle imbrication. A canted bay window is situated at the front of the projecting gable. To the left is a recessed porch under a shed roof canopy and with a wood balustrade. Some fixed wood sash windows have been retained, including in the bay window, but others have been replaced with vinyl sash double-hung types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
Front (west) elevation
2015



View to the southeast
West (front) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-51 DAHP No.

Historic Name: House at 5001 Freeman Road E

Common Name: Asbjornsen House

Property Address: 5001 Freeman Rd E, Puyallup, WA 98371-3227

Comments:

Tax No./Parcel No. 0420201036

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188104

Northing: 690141

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Joyce Asbjornsen

Owner Address: 5005 Freeman Road E

City: Puyallup State: WA Zip: 98371-3227

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: L-Shape

Stories: 2

Structural System: Braced Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Slight

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Queen Anne	Wood - Clapboard Shingle - Diamond	Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Gable Front and Wing

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1904 Built Date

1950 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was built in 1904, when it was still common for residences to exhibit Victorian Style elements. Familiar characteristics present here include the gable front and wing configuration, the enclosed eaves with cornice returns, the shingle imbrication, the gabled wall dormer, and the wide front porch. Although a fair example of the style, and retaining much of its historic appearance, the replacement of all original windows with vinyl materials renders this house ineligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 2-story wood frame building with an L-shaped plan in a gable front and wing configuration. The roof is covered with composition shingles and has moderately wide, unenclosed eaves with cornice returns. A gabled wall dormer is centered on the south roof slope. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal clapboard siding, with corner boards, except in the front-facing gable, which is clad with diamond shingle imbrication. The primary front entry is situated beneath a hip-roofed canopy supported by wood pasts. The wood porch has lattice half-walls. A secondary entry is located in the crook of the L, beneath a shed-roofed canopy supported by a wood post. A canted bay window with a shed roof is situated on the south elevation. The windows are all vinyl sash and include both multiple-pane casement and double-hung. All are flanked by faux wood shutters.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
West (front) and north elevations
2016



View to the northeast
West (front) and south elevations
2016



View to the est
West (front) elevation
2016

Historic Inventory Report

Location

Field Site No. SR167-52 DAHP No.

Historic Name: House at 5005 Freeman Road E

Common Name: Johnson House 1

Property Address: 5005 Freeman Rd E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420205003

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188095

Northing: 689964

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Richard and Carol Johnson

Owner Address: 1405 21st Street SW

City: Puyallup State: WA Zip: 98371-6629

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Braced Frame
Changes to Plan: Extensive
Changes to Interior: Unknown
Changes to Original Cladding: Moderate
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood - Board-and-Batten	Gable - Side Gable Flat with Eaves	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1960 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records do not offer a date of construction. The 1960 date is a guess based on the Ranch Style features of the house, mainly the horizontal elevational profile, the massive masonry chimney, and the shallow pitched roof with wide enclosed eaves. The out-sized garage does not really fit and is most likely a later addition. The windows may or may not be original. Overall this is not a good example of the Ranch Style and it is not eligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with an L-shaped plan consisting of the side-gabled house and a large hip-roofed garage. The garage projects forward from the left side of the house, forming the L. The shallow-pitched roof is covered with composition shingles and as widely-overhanging enclosed eaves. A massive stone chimney emerges from near the crest of the house roof. The foundation is poured concrete. Exterior wall surfaces are clad with board and batten siding. The garage has two large metal vehicle doors. All windows of the house are metal sash fixed and sliding units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
Garage, west elevation
2016



View to the east
West (front) elevation
2016

Historic Inventory Report

Location

Field Site No. SR167-53 DAHP No.

Historic Name: House at 8305 49th Street E

Common Name: Annon House

Property Address: 8305 49th St E, Puyallup, WA 98371-2501

Comments:

Tax No./Parcel No. 0420201040

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188398

Northing: 690593

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: David Annon

Owner Address: 8305 49th Street E

City: Puyallup State: WA Zip: 98371-2501

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Vacant/Not in Use
Plan: L-Shape
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Moderate
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle
Modern - Minimal Traditional			

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1942 Built Date
1963 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The construction date of 1942 is about right for a designation as a World War II Era Cottage, although the projecting gabled wing gives it a sort of Minimal Traditional appearance. The building is currently vacant, with access partially blocked by downed trees. It lacks sufficient distinction to qualify for National Register of Historic Places consideration.

Description of Physical Appearance: This house is a 1-story wood frame structure with an L-shaped plan created by a side gable with a forward projecting gabled wing. The roof is covered with composition shingles and has abrupt enclosed eaves. A brick chimney emerges from the roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal wood clapboard siding. The front entry is recessed into a gabled vestibule. Windows appear to be metal sash fixed and sliding units. Northwest of the house is a front-gabled 2-car garage clad in plywood.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
House, west (front) and south elevations
2015



View to the north
Garage, south (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-54 DAHP No.

Historic Name: House at 8319 49th Street E

Common Name: Westby House

Property Address: 8319 49th St E, Puyallup, WA 98371-2501

Comments:

Tax No./Parcel No. 0420205017

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188579

Northing: 690557

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Lyle and Lavon Westby

Owner Address: 8319 49th Street E

City: Puyallup State: WA Zip: 98371-2501

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood - Clapboard Wood - Vertical Brick	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1900 Built Date
1975 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: If real estate records are correct, this house was built in 1900, a very early date for its semi-Ranch Style appearance, evoked by the shallow-pitched roof, horizontal elevational profile, and massive masonry chimney. The building may have acquired these characteristics during a 1975 remodel. The metal sash windows are likely a later addition as well. Due to extensive alterations, this house is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with a rectangular plan. The side-gabled, shallow-pitched roof is covered with composition shingles and has moderately-wide enclosed eaves. The foundation is poured concrete. Exterior wall surfaces include a skirt of wood clapboard, with vertical board above, and a veneer of multi-colored brick in the west wall and the front door surround. The same brick is used in a full-height exterior brick chimney that penetrates the eave of the west wall. The front entry is situated at the west end of the facade, approached beneath a gabled canopy supported by wood posts. The windows include both fixed and sliding types, all metal sash. Some of them are flanked by faux shutters.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-55 DAHP No.

Historic Name: House at 8320 49th Street E

Common Name: Almont House

Property Address: 8320 49th St E, Puyallup, WA 98371-2502

Comments:

Tax No./Parcel No. 0420201032

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188615

Northing: 690376

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Charles and Isabelle Almont

Owner Address: 8320 49th Street E

City: Puyallup State: WA Zip: 98371-2502

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 1

Structural System: Braced Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch - World War II Era Cottage	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - WWII Era Cottage

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction:

1949 Built Date

1967 Remodel

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Built in 1949, this modest residence has the typical look of a World War II Era Cottage, with its boxy shape and short enclosed eaves. The enclosed back porch appears to be a later addition, perhaps added during a 1967 remodel. According to the owner, all of the original windows were replaced in 2013, rendering this house ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This house is a 1-story wood frame building with a rectangular plan. The roof is covered with composition shingles and has abrupt enclosed eaves. A brick chimney emerges from the roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with wood clapboard siding and corner boards, except for a shed-roofed back porch that is clad with vertical board. The front door accesses a small enclosed entry vestibule with a gabled roof. Windows include metal and vinyl sash types, both fixed and double-hung. A side gabled garage is situated just southwest of the house. It is clad with composition shingles and vertical board siding. A shed-roofed addition is attached to the side. To the front are two roll-up wood panel vehicle doors and a wood panel pedestrian door.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
West (front) and north elevations
2015



View to the southwest
Garage, north and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-56 DAHP No.

Historic Name: House at 1124 Valley Avenue NW

Common Name: Blue Sky Landscaping

Property Address: 1124 Valley Ave NW, Puyallup, WA

Comments:

Tax No./Parcel No. 0420163017

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	16			Pierce	PUYALLUP

Coordinate Reference

Easting: 1190463

Northing: 691895

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Kevin Ash and Leslie Faris

Owner Address: 8605 29th Street Ct E

City: Edgewood State: WA Zip: 98371-1905

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Commerce/Trade - Business
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Extensive
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood Veneer - Stone	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Architecture/Landscape Architecture

Other

Date of Construction: 1965 Built Date

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house has been converted from single family occupancy to office space. On the exterior, it is an elaborate rendition of the Ranch Style, which was an ascendant idiom in 1965, when this building was constructed. Classical diagnostic features include the shallow-pitched roof with widely-overhanging enclosed eaves, the horizontal profile, and the massive masonry chimney. The metal and vinyl sash windows were most likely wood sash when installed. This departure from original construction materials precludes National Register of Historic Places for this building.

Description of Physical Appearance: This former residence is a sprawling example of the Ranch Style house. It is a 1-story wood frame building with a shallow-pitched hip roof embellished with gablets at each end and above several forward projecting extensions. The roof is covered with composition shingles and has widely-overhanging, enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are primarily clad with horizontal wood siding. However, portions of the walls are clad with white stone veneer that appears to be real. The same white stone is also applied as a veneer to a massive chimney that emerges from near the roof crest at the east end of the building. The windows include both metal and vinyl sash sliding units. The interior has been reconfigured to accommodate business offices.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
North (front) elevation
2015



View to the southeast
North (front) and west elevations
2015



View to the south
North (front) elevation, east end
2015

Historic Inventory Report

Location

Field Site No. SR167-57 DAHP No.

Historic Name: House at 10903 Morning Side Drive E

Common Name: Akker House

Property Address: 10903 Morning Side Dr E, Puyallup, WA

Comments:

Tax No./Parcel No. 0420223113

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197009

Northing: 686570

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Fredrick Akker and Jiang Dai

Owner Address: 53 Swanson Ct Apt 31c

City: Boxborough State: MA Zip: 01719-1363

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Irregular
Stories: 1
Structural System: Braced Frame
Changes to Plan: Moderate
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Shingle - Combed	Hip	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1950 Built Date
1967 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence exhibits some elements of the Ranch Style. If the real estate records are correct, it was built in 1950, making it a very early example of the style. The primary design features that put it in the Ranch category are the shallow-pitched hip roof and the horizontal profile of the facade. The combed wood shingle siding were also a common feature of early Ranch Style houses. Another common ranch component, the attached garage, is situated in an unusual canted configuration. The building was remodeled in 1967, and received other modifications at later dates. The front canopy is probably one of these modifications, as is the replacement of all original windows with vinyl sash units. These alterations render the house ineligible for listing on the National Register of Historic Places.

Description of Physical Appearance: This 1-story wood frame house has a semi-rectangular plan, with an attached canted garage. The shallow-pitched hip roof is covered with composition shingles and has widely-overhanging enclosed eaves. Both ends of the roof feature a small gablet with ventilation louvers. The foundation is poured concrete. Exterior wall surfaces are clad with combed wood shingles. A nearly flat canopy of corrugated metal spans the length of the front elevation, supported by milled wood posts. All windows are vinyl sash, most with multiple panes, and include both fixed and sliding types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
South (front) and west elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-58 DAHP No.

Historic Name: House at 10911 Morning Side Drive E

Common Name: Provstgaard House

Property Address: 10911 Morning Side Dr E, Puyallup, WA 98372

Comments:

Tax No./Parcel No. 0420223122

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197155

Northing: 686510

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Jueleen Provstgaard

Owner Address: 10911 Morning Side Drive E

City: Puyallup State: WA Zip: 98372-2771

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Braced Frame
Changes to Plan: Unknown
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern	Veneer - Vinyl Siding	Flat with Eaves	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1900 Built Date
1976 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house, with its flat roof and horizontal elevations, presents a thoroughly Mid-Century Modern appearance, which is belied by the 1900 construction date. If correct, it means that the building has been extensively modified. This, and the replacement of all windows and siding with modern materials, renders this building ineligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building with an L-shaped plan. The flat roof probably has some kind of built-up covering. The eaves have a wide elevational profile and are boxed. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal vinyl siding. All windows are metal sash sliding types. The inside corner of the L-plan contains a wood frame deck with pergola.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the north
South (front) elevation
2015



View to the northwest
South (front) and east elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-59 DAHP No.

Historic Name: House at 11009 Morning Side Drive E

Common Name: Qunell House

Property Address: 11009 Morning Side Dr E, Puyallup, WA 98372-2767

Comments:

Tax No./Parcel No. 0420224169

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197330

Northing: 686425

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Terry and Jeanne Qunell

Owner Address: 11009 Morning Side Drive E

City: Puyallup State: WA Zip: 98373-2767

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Brick - Common Bond	Gable - Side Gable	Clay Tile

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Architecture/Landscape Architecture

Other

Date of Construction:
1964 Built Date
1974 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This residence is an atypical example of the Ranch Style, built in 1964 at the apex of its popularity. Definitive characteristics include the shallow-pitched roof with widely-overhanging enclosed eaves, the massive masonry chimney, and the horizontal elevational configuration. The use of Spanish Mission Style roof tiles is unusual. The building exhibits mostly good integrity of historical appearance and original construction materials, except for one crucial departure: The replacement of all original windows with vinyl sash units. This modification alone is enough to remove this house from National Register of Historic Places consideration.

Description of Physical Appearance: This house is a 1-story wood frame structure with a rectangular plan. The side-gabled roof is covered with clay Spanish Mission Style tiles. It is shallow-pitched and has widely-overhanging enclosed eaves and exposed purlins in the gables. A massive brick chimney emerges from near the center roof crest. The foundation is poured concrete. Exterior wall surfaces are clad with multi-colored brick laid in common bond, except for the gable faces at each end, which are covered with horizontal wood siding. All windows are vinyl sash and include both picture and sliding types. To the west of the house is an unattached garage, also with brick wall cladding and a tile roof. It has three roll-up vehicle doors.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



view to the southwest
East (front) and north elevations
2015



view to the northwest
East (front) and south elevations
2015



View to the west
East (front) elevation
2015



View to the north
Garage, south (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-60 DAHP No.

Historic Name: House at 11108 Morning Side Drive E

Common Name: Thomsen House

Property Address: 11108 Morning Side Dr E, Puyallup, WA 98372-2768

Comments:

Tax No./Parcel No. 0420224153

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	46			Pierce	PUYALLUP

Coordinate Reference

Easting: 1197713

Northing: 686334

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Lila Thomsen

Owner Address: 11108 Morning Side Drive E

City: Puyallup State: WA Zip: 98372-2768

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Slight
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Ranch	Wood - Vertical	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Ranch

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1964 Built Date
1974 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: This house was constructed in 1964, a time when the Ranch Style was the most popular residential idiom in the country. Character defining elements present in this building include the long, horizontal elevational profile, the shallow-pitched roof with widely-overhanging, enclosed eaves, and the massive masonry chimney. The primary departure from architectural integrity of original materials is the replacement of all wood sash windows with modern vinyl types, precluding National Register of Historical Places for this house.

Description of Physical Appearance: This 1-story wood frame residence has a sprawling horizontal plan consisting of the side-gabled house and the attached side-gabled garage. The shallow-pitched roof is covered with composition shingles and has widely-overhanging, enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are clad with vertical board siding, except in the gable faces, which are clad with horizontal wood siding. The attached garage at the west end has a higher roof and projects forward from the house. It has a roll-up wood panel vehicle door. The front entry to the house is centrally located and contains a double set of wood panel doors. Above it is a short gabled canopy supported by milled wood posts. All windows are vinyl sash and include both picture and sliding types. A massive exterior brick chimney is situated to the left of the front entry, penetrating the eaves.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southwest
North (front) elevation
2015



View to the southeast
North (front) elevation
2015

Historic Inventory Report

Location

Field Site No. SR167-61 DAHP No.

Historic Name: House at 5117 Freeman Road E

Common Name: Johnson House 3

Property Address: 5117 Freeman Rd E, Puyallup, WA 98371-2513

Comments:

Tax No./Parcel No. 0420205003

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188212

Northing: 689694

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Richard Johnson

Owner Address: 1405 21st Street SW

City: Puyallup State: WA Zip: 98371-6629

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Arts & Crafts - Craftsman	Wood - Clapboard	Gable - Cross Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Cross Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1930 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records give no construction date for this house. 1930s is just a guess, putting it in the decade when the Craftsman Style was at the height of its popularity. This house is only mildly representative of the style, with only the open eaves and knee braces indicative of it. Otherwise it is just another vernacular cottage, unpretentious but tidy. It lacks sufficient distinction for National Register of Historic Places consideration.

Description of Physical Appearance: This house is a cross-gable affair, with two gabled sections forming a T. In the crook of the T is an enclosed area with a shed roof, completing what is basically a rectangular plan. The roof is covered with composition shingles and has wide, open eaves that are supported in the gables by knee braces. The foundation is concrete block. Exterior wall surfaces are clad with narrow horizontal wood siding. Front and back entries are centered in the gable faces, both with shed-roofed canopies. A shed-roofed bay window projects from the east elevation. All windows are metal sash and include both fixed and double-hung types. Southeast of the house is a front-gabled single-car garage with siding and roof similar to that of the house, with an open carport to the front.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West and south elevations
2016



View to the southeast
North (front) and west elevations
2016



View to the southwest
North (front) and east elevations
2016

Historic Inventory Report

Location

Field Site No. SR167-62 DAHP No.

Historic Name: House at 5123 Freeman Road E

Common Name: Johnson House 2

Property Address: 5123 Freeman Rd E, Puyallup, WA 98371-2513

Comments:

Tax No./Parcel No. 0420205003

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188108

Northing: 689676

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Richard Johnson

Owner Address: 1405 21st Street SW

City: Puyallup State: WA Zip: 98371-6629

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: L-Shape
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Extensive
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Veneer - Vinyl Siding	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1930 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records do not record a construction date for this house. The 1930 year is a guess. This simple cottage suggests no particular style characteristics, so is relegated to the vernacular column. The siding and windows have been replaced. The building is not eligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1-story wood frame building consisting of the main side-gabled portion, full-width shed roof extension to the back, and a further half-width extension to the rear as well, forming an L-shaped plan. The roof is covered with composition shingles and has short, open eaves. A brick chimney emerges near the roof crest. The foundation is concrete block. Exterior wall surfaces are clad with horizontal vinyl siding with corner boards. A wood panel door occupies the central front (west) entry. All windows are modern metal sash units, including double-hung and sliding types.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2016



North and east elevations
2016

Historic Inventory Report

Location

Field Site No. SR167-63 DAHP No.

Historic Name: House at 5117 Freeman Road E

Common Name: Johnson House 4

Property Address: 5117 Freeman Rd E, Puyallup, WA 98371-2513

Comments:

Tax No./Parcel No. 0420205003

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188215

Northing: 689880

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Richard Johnson

Owner Address: 1405 21st Street SW

City: Puyallup State: WA Zip: 98371-6629

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House

Current Use: Domestic - Single Family House

Plan: Rectangle

Stories: 1 1/2

Structural System: Braced Frame

Changes to Plan: Intact

Changes to Interior: Unknown

Changes to Original Cladding: Intact

Changes to Windows: Extensive

Changes to Other:

Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Modern - Minimal Traditional	Wood - Clapboard	Gable - Side Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family - Side Gable

Narrative

Study Unit

Other

Architecture/Landscape Architecture

Date of Construction: 1950 Built Date

Builder:

Engineer:

Architect:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records do not provide a construction date for this house. The 1950 date was selected because that was a year when this style of residence was prevalent. Elements of the Minimal Traditional Style present in this building include the boxy shape, the side gable with gable front configuration, the masonry chimney, and the short enclosed eaves. Unfortunately all windows have been replaced with modern vinyl sash types, rendering the house ineligible for placement on the National Register of Historic Places.

Description of Physical Appearance: This residence is a 1 1/2-story wood frame building consisting of a rectangular side-gabled main portion and a gabled extension to the south. Also, a front-gabled extension projects forward (west). The roof is covered with composition shingles and has abrupt enclosed eaves. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal clapboard siding, except in the face of the gable front, where scalloped vertical board is used. Also on the gable front is a full-height exterior brick chimney that penetrates the eave. Windows are multiple-pane vinyl sash units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the east
West (front) elevation
2016



View to the northeast
West (front) and south elevations
2016

Historic Inventory Report

Location

Field Site No. SR167-64 DAHP No.

Historic Name: House at 8212 49th Street E

Common Name: Grellis House 3

Property Address: 8212 49th St E, Puyallup, WA 98371-2523

Comments:

Tax No./Parcel No. 0420201045

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188295

Northing: 690398

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Dennis Grelis

Owner Address: 2132 Browns Point Blvd

City: Tacoma State: WA Zip: 98422-2312

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Historic Inventory Report

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1
Structural System: Braced Frame
Changes to Plan: Intact
Changes to Interior: Unknown
Changes to Original Cladding: Intact
Changes to Windows: Intact
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Shingle - Coursed	Saltbox	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Block	Single Family - Side Gable

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction: 1950 Built Date
Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: The construction date of this modest cottage is not recorded in real estate records. The 1950 date is just a guess. Although it appears to retain original construction materials, it lacks sufficient distinction for National Register of Historic Places consideration.

Description of Physical Appearance: This house is a 1-story wood frame building with a salt box roof configuration. The side gable has a shed roofed entry vestibule to the south end. The roof is covered with composition shingles and has short enclosed eaves. The foundation is concrete block. Exterior wall surfaces are clad with coursed wood shingles. Windows are fixed and sliding wood sash units.

Major Bibliographic References:

Yamamoto, Christopher, and Stephen Emerson.
2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the southeast
West (front) and north elevations
2015

Historic Inventory Report

Location

Field Site No. SR167-65 DAHP No.

Historic Name: House at 4923 Freeman Road E

Common Name: Rubke House

Property Address: 4923 Freeman Rd E, Puyallup, WA 98371-2513

Comments:

Tax No./Parcel No. 0420201027

Plat/Block/Lot

Acreage < one

Supplemental Map(s)

Township/Range/EW	Section	1/4 Sec	1/4 1/4 Sec	County	Quadrangle
T20R04E	20			Pierce	PUYALLUP

Coordinate Reference

Easting: 1188105

Northing: 690265

Projection: Washington State Plane South

Datum: HARN (feet)

Identification

Survey Name: SR167, Tacoma-Puyallup Date Recorded: 12/10/2015

Field Recorder: S. Emerson

Owner's Name: Benjamin and Patricia Rubke

Owner Address: 4923 Freeman Road E

City: Puyallup State: WA Zip: 98371-2523

Classification: Building

Resource Status: Comments:
Survey/Inventory

Within a District? No

Contributing? No

National Register:

Local District:

National Register District/Thematic Nomination Name:

Eligibility Status: Not Determined - SHPO

Determination Date: 1/1/0001

Determination Comments:

Description

Historic Use: Domestic - Single Family House
Current Use: Domestic - Single Family House
Plan: Rectangle
Stories: 1 1/2
Structural System: Braced Frame
Changes to Plan:
Changes to Interior: Unknown
Changes to Original Cladding: Moderate
Changes to Windows: Extensive
Changes to Other:
Other (specify):

Style:	Cladding:	Roof Type:	Roof Material:
Vernacular	Veneer - Vinyl Siding	Gable - Front Gable	Asphalt / Composition - Shingle

Foundation:	Form/Type:
Concrete - Poured	Single Family

Narrative

Study Unit
Other
Architecture/Landscape Architecture

Date of Construction:
1935 Built Date
1960 Remodel

Builder:
Engineer:
Architect:

Property appears to meet criteria for the National Register of Historic Places: No
Property is located in a potential historic district (National and/or local): No
Property potentially contributes to a historic district (National and/or local): No

Statement of Significance: Real estate records indicate that this house was built in 1935, and remodeled in 1960. The result is a building that probably bears little resemblance to the original, which was probably a simple front-gabled farm house. The overly-large wall dormers are definitely a later application. Also the clapboard appears little worn. All of the windows have been replaced by modern vinyl types. These extensive alterations preclude National Register of Historic Places for this house.

Description of Physical Appearance: This residence is a 1 1/2-story wood frame building with a front-gabled, rectangular plan. Its most prominent features are the two shed-roof (nearly flat) wall dormers of the roof slopes. These create the upper half story. The roof is covered with composition shingles and has short enclosed eaves with cornice returns. The foundation is poured concrete. Exterior wall surfaces are clad with horizontal wood clapboard siding with corner boards. A projecting gabled extension to the front is offset to the right side of the facade. The front entry is recessed to one side, while the front of the extension contains a large picture window. Windows are all vinyl sash units and include both fixed and double-hung types.

Major Bibliographic References:

Yamamoto, Christopher, Stephen Emerson, and Rebecca Stevens

2015 Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project-Puyallup to SR 509, Pierce County, Washington. Short Report DOT 15-04. Archaeological and Historical Services, Cheney.

Photos



View to the northeast
West (front) and south elevations
2015



View to the east
West (front) elevation
2015

Appendix D

Shovel Test Data Tables

Table D.1. Shovel Test Data, 2015 Project Area.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
1	56	110	none	0-30 cm: Light brown silty sand, thick root matrix - A horizon; 30-40 cm: Grayish brown medium to coarse grained sands, 35% small to medium, rounded to subrounded, gravels, rootlets present; 40-80 cm: Dark grayish brown slightly sandy silt, high level of oxidation present, rootlets present, 5% small pebbles, ped structure was friable, medium sized peds; 80-110 cm: Grayish brown very fine sand, oxidation present, rootlets present	shovel limit
2	54	80	none	0-18 cm: Brown silty fine sand, few rounded to subrounded, small to large pebbles, few fine roots, few charcoal flecks, abrupt, smooth lower boundary, disturbed A horizon; 18-65 cm: Gray coarse sand, few rounded to subrounded, small to large pebbles, common dark yellow mottles, some a horizon mixed in, disturbed B/alluvial sediment; 65-80 cm: Gray coarse sand, few rounded to subrounded, small to large pebbles, common dark yellow mottles, intact B horizon	impenetrable gravels
3	54	100	0-30 cm: modern debris	0-30 cm: Slightly silty medium to coarse sand, brown, fine root matrix throughout, charcoal lens above sand; 30-45 cm: Light brown highly compacted medium to coarse sand, trace rootlets, some oxidation; 45-75 cm: Light brown highly compacted medium to coarse sand with 80% gravels and cobbles, 75-100 cm: Grayish brown compacted fine sands, oxidation present	shovel limit
4	54	110	0-20 cm: modern debris	0-20 cm: A horizon, hummus overlying many roots, dark brown, friable medium to coarse sand, clear boundary 20-65 cm: Light brown, compacted coarse sand with red staining, small to medium rounded pebbles, diffuse boundary; 65-110 cm: Light gray compact fine sand, red staining, no pebbles	shovel limit
5	54	100	0-30 cm: modern debris	0-30 cm: A horizon, dark brown silty sand; 30-45 cm: Light brown compact fine sand, some rootlets present; 45-60 cm: Light brown, dry, medium to coarse sand, small to large pebbles, this layer appears to be an old river channel; 60-100 cm: Grayish brown, compact very fine sand, this layer appears undisturbed,	shovel limit
6	53	100	none	0-32 cm: Dark brown silty sand, many small roots, clear and wavy boundary, A horizon; 32-75 cm: Light brown silty very fine sand, few fine roots, gradual and wavy boundary, B horizon; 75-100 cm: Light gray silt, compact, common dark yellow mottles, Bw horizon	shovel limit
7	53	100	none	0-40 cm: A horizon, loose dark brown slightly silty sand, fine root matrix throughout, few larger roots from surrounding trees; 40-85 cm: Light gray very fine sand, dry and loose; 85-100 cm: Light gray, slightly silty very fine sand, compacted, slight oxidation present	shovel limit
8	53	100	40-60 cm: saw cut bone (cow?)	0-20 cm: A horizon, dark brown slightly silty very fine sand, fine root matrix throughout; 20-70 cm: Brown fine sand, highly oxidized, trace rootlets; 70-100 cm: Grayish brown silty fine sand, highly oxidized, pred structures was medium blocky and friable	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
9	53	95	0-37 cm: modern debris	0-37 cm: Dark brown silty fine sand, many fine roots, disturbed (plastics present), clear and smooth boundary; 37-73 cm: Light brown silty very fine sand, few rootlets, some compact silt nodules present, disturbed B horizon; 73-95 cm: Gray to light gray silt, common dark yellow mottles, increasing compaction, intact native alluvium	shovel limit
10	601	102	30 cm: 1 aqua glass fragment	0-8 cm: A horizon, fine root matrix, brown very fine slightly silty sand; 8-60 cm: Light brown slightly silty fine sand with oxidation; 60-102 cm: Grayish brown fine sand with oxidation and mottling, small friable peds	shovel limit
11	601	102	0-59 cm: glass fragments, 1 nail	0-59 cm: Gravelly, very fine dark brown sandy silt, many angular to subrounded, small to large pebbles, some angular to subangular pebbles present, common rootlets to small roots, abrupt and smooth boundary; 59-77 cm: Black, gravelly, very fine sandy silt, friable, few small subangular to subrounded pebbles, clear and smooth boundary; 77-102 cm: Gray very fine sandy silt	shovel limit
12	601	100	none	0-60 cm: A horizon, many roots, brown fine sand, slightly silty, compact, clear boundary; 60-100 cm: Light gray silty sand, iron oxide staining, compact	shovel limit
13	601	100	none	0-40 cm: A horizon, fine root matrix, brown slightly silty fine sand, clear lower boundary; 40-100 cm: Light grayish brown oxidized silty fine sand, trace rootlets down to 90cmbs, dry	shovel limit
14	601	100	none	0-55 cm: Brown very fine gravelly sandy silt, few subrounded to subangular small pebbles, common rootlets, clear broken boundary; 55-100 cm: Light gray very fine sandy silt, very few small subrounded pebbles	shovel limit
15	601	100	none	0-40 cm: Slightly silty fine sand, roots, compact, wavy boundary; 40-100 cm: Light gray with oxidized staining, medium sand with some silt, compact	shovel limit
16	601	100	20 cm: plastics; 30-45 cm: 3 clear glass fragment	0-30 cm: A horizon, brown slightly silty medium to coarse sand, thick root matrix throughout, this layer was fill, 80% subangular gravels; 30-45 cm: Grayish brown fine sand with high level of oxidation; 45-55 cm: Highly oxidized coarse grained sand layer; 55-65 cm: Grayish brown slightly silty fine sand; 65-70 cm: Highly oxidized coarse sand layer; 70-85 cm: Grayish brown very fine sand, oxidation and mottling; 85-100 cm: Light grayish brown very fine sand, oxidation and mottling	shovel limit
17	601	100	none	0-50 cm: Light brown medium sand with little silt, roots, small pebbles to small cobbles (80%), wavy boundary; 50-75 cm: Grayish brown very fine sand with some silt, compact, subrounded to subangular medium to small pebbles (80%), cobbles present, 75-100 cm: Gray fine sand with silt, compact with oxidation staining throughout	shovel limit
18	601	75	none	0-75 cm: Gravelly, brown very fine sandy silt, many small to large subrounded to subangular pebbles, many small to medium subangular to subrounded cobbles, very few rootlets	impenetrable gravels
19	601	59	none	0-59 cm: Gravelly, brown fine sandy silt, many small to large subrounded to subangular pebbles, many subrounded to subangular small to medium cobbles, few rootlets and fine roots	impenetrable gravels
20	601	100	70 cm: modern debris (plastics)	0-90 cm: Weak A horizon about 4 cm thick overlying brown silty sand, 90% rounded to subrounded cobbles, disturbed, highly compact throughout; 90-100 cm: Grayish brown slightly silty sand, wet	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
21	601	90	none	0-90 cm: Brown medium sand with some silt, small pebbles to small cobbles, rounded, many (80%)	compaction
22	604	44	none	0-44 cm: Gravelly, brown fine to medium sandy silt, very compact, many small to large, rounded to subangular pebbles, few subrounded small cobbles	pooling water
23	604	37	none	0-37 cm: Gravelly, brown fine to medium sandy silt, very compact, many small to large subrounded to rounded pebbles	pooling water
24	604	59	none	0-59 cm: Gravelly, brown fine to medium sandy silt, very compact, many small to large angular to rounded pebbles	compaction
25	604	100	none	0-30 cm: Brown fine sand with silt, roots, friable, diffuse boundary; 30-80 cm: Light gray silt with oxidation staining, compact, clear boundary; 80-100 cm: Gray silty fine sand, compact	shovel limit
26	604	100	none	0-40 cm: A horizon, fine roots, brown slightly sandy silt; 40-100 cm: B horizon, light gray silt with oxidation, this strat gradually becomes more sandy, fine sand	shovel limit
27	604	100	none	0-68 cm: Dark yellowish brown sandy silt, gravelly, few small to medium subrounded to subangular pebbles, few rootlets and fine roots, clear wavy boundary; 68-100 cm: Dark gray gravelly silt, very few very small to small rounded to subrounded pebbles	shovel limit
28	604	45	45 cm: PVC utility	0-45 cm: Gravelly, dark brown sandy silt, common subrounded to subangular small to large pebbles, common small to medium subrounded to subangular cobbles, common rootlets to medium roots, PVC pipe at bottom	compaction
29	604	50	0-50 cm: 1 glass fragment, 1 metal fragment	0-50 cm: Fill, brown slightly sandy silt, many gravels, small pebbles to medium cobbles, rounded to angular	compaction
30	601	30	none	0-30 cm: Wet, compact, brown silt loam, 10% gravels, poorly sorted, medium pebbles	pooling water
31	601	95	95 cm: asphalt	0-38 cm: Fill, gravelly, brown fine to medium coarse sandy silt, many small to large subangular to rounded pebbles, few small subrounded cobbles, common rootlets, abrupt smooth boundary; 38-95 cm: Gravelly, dark gray sandy silt, many subangular to rounded, small to large pebbles, few small to medium pieces of asphalt at 58 cmbs and below Large asphalt chunk at 95 cmbs	shovel limit
32	601	101	85 cm: asphalt	0-101 cm: Fill, brown fine to medium sandy silt, many small to medium subrounded to rounded cobbles, common to many small to large subrounded to subangular pebbles, few rootlets, color change at 48 cmbs to darker brown, however sediment/soil type stays the same	shovel limit
33	601	74	none	0-23 cm: Brown fine silty clay, many small to large subrounded to rounded pebbles, common small to medium angular to rounded cobbles, very few rootlets and fine roots, clear and wavy boundary; 23-63 cm: Dark brown with light brown mottling, coarse sandy silt, many small to large subangular to subrounded pebbles, few small angular to subangular cobbles, few medium roots, clear and wavy boundary; 63-74 cm: Dark gray silty clay, very compact	sidewalls caving in
34	601	30	0-30 cm: asphalt	0-30 cm: Silt, gravel, modern trash	pooling water
35	601	15	0-15 cm: asphalt	0-15 cm: Silt, gravel, modern trash	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
36	601	30	none	0-30 cm: Fill and gravels Standing water on surface	pooling water
37	601A	70	none	0-10 cm: Brown silt loam, 10% poorly sorted gravels, several small rounded cobbles; 10-70 cm: Light brown orangey sandy loam, 30% gravels, poorly sorted, wet, compact	impenetrable gravels
38	601A	20	none	0-20 cm: Fill; brown slightly sandy silt, many gravels, small pebbles to medium cobbles, rounded, wet	pooling water
39	604	100	44-100 cm: 1 clear glass fragment	0-44 cm: Gravelly, brown very fine sandy silt, common small to medium subrounded to subangular pebbles, few small to medium subrounded cobbles, clear and smooth boundary; 44-100 cm: Gravelly, light grayish brown very fine sandy silt, many small to large subrounded to subangular pebbles, compact	shovel limit
40	604	100	none	0-40 cm: A horizon, dense root matrix, dry, brown sandy silt, medium peds, friable; 40-75 cm: Silty sand with oxidation; 75-100 cm: Lens of oxidation at 80 cmbs, dry fine sand with trace silt	shovel limit
41	601A	40	none	0-40 cm: Fill, coarse sand with gravels and cobbles, heavily saturated	pooling water
42	601A	35	none	0-35 cm: Fill, coarse sand with gravels and cobbles, heavily saturated	pooling water
43	601A	35	none	0-35 cm: Fill, coarse sand with gravels and cobbles, heavily saturated	pooling water
44	601	42	0-42 cm: asphalt	0-42 cm: Gravelly, brown fine to medium sandy silt, many small to large rounded to subangular pebbles, few small subrounded cobbles, few medium asphalt pieces	pooling water
45	604	18	none	0-18 cm: Gravelly, brown fine sandy silt, many small to large, rounded to subangular pebbles, very compact	pooling water
46	601A	20	none	0-20 cm: Fill, brown silt loam, very wet, 10% gravels, inundated with water	pooling water
47	601A	25	none	0-25 cm: Fill, coarse sand with gravels and cobbles, heavily saturated	pooling water
48	66	100	none	0-35 cm: Grayish brown very slightly silty fine sand, roots, clear boundary; 35-75 cm: Brown fine sand, compact, clear boundary; 75-100 cm: Gray silt, compact	shovel limit
49	66	100	none	0-62 cm: Gravelly, dark brown fine sandy silt, few very small to small rounded to subrounded pebbles, few fine to medium roots, clear and smooth boundary; 62-100 cm: Gravelly, light brownish gray very fine silt, compact, very few rounded to subrounded pebbles, reddish orange oxidation in soil	shovel limit
50	601A	100	none	0-30 cm: A horizon, very slightly silty fine to medium sand, dense rootlets throughout; 30-80 cm: Grayish brown fine sand with trace silt, oxidation present; 80-100 cm: Light gray fine sand, some oxidation	shovel limit
51	601A	20	none	0-20 cm: Sediment had a strong smell of contaminants, shovel test was terminated	contaminated sediments
52	601A	30	none	0-30 cm: Fill, coarse sand with gravels and cobbles, heavily saturated	pooling water
53	66	101	none	0-39 cm: Gravelly, brown fine to medium sandy silt, very few very small to small rounded to subrounded pebbles, few rootlets, gradual and wavy boundary; 39-101 cm: Light grayish brown fine silt, very few very small rounded to subrounded pebbles	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
54	66	100	none	0-36 cm: Gravelly, light brown fine sandy silt, few small to very small rounded to subrounded pebbles, clear and smooth boundary, few rootlets and fine roots; 36-100 cm: Very light brown very fine sandy silt, very few very small to small subrounded to rounded pebbles	shovel limit
55	66	100	none	0-5 cm: Weak A horizon, rootlets; 5-80 cm: Grayish brown slightly sandy silt, oxidation present, moist; 80-100 cm: Gray medium sand, well sorted, abrupt horizon, moist	shovel limit
56	66	100	none	0-51 cm: Gravelly, brown fine sandy silt, few small to medium subrounded to rounded pebbles, few fine to coarse roots, gradual and wavy boundary; 51-100 cm: Gravelly, light brownish gray fine sandy silt, compact, very few very small rounded to subrounded pebbles, orangey red mottling from oxidation	shovel limit
57	601A	100	none	0-50 cm: Brown fine sand, roots, friable, clear boundary; 50-80 cm: Grayish brown fine sand, oxidation, compact, clear boundary; 80-100 cm: Gray silt, compact	shovel limit
58	66	65	none	0-12 cm: Gravelly, light brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 12-65 cm: Gravelly, light brownish gray fine sandy silt, very compact, very few very small subrounded pebbles, orangey red mottling from oxidation	compaction
59	89/90	50	none	0-30 cm: Very dark brown clayey silt, few rounded to subrounded large pebbles, organic rich soil, many medium roots to rootlets, heavily bioturbated, moist, clear and smooth lower boundary, A horizon, humic wetland deposit; 30-50 cm: Gray silty clay, common dark yellow mottles, moist to saturated, B horizon	pooling water
60	89/90	100	0-30 cm: 6 wire nails	0-30 cm: A horizon, dark brown fine sand, few small pebbles, friable, roots, clear boundary; 30-65 cm: Grayish brown slightly silty fine sand, compact, clear boundary; 65-100 cm: Gray silt, compact, wet	shovel limit
61	105	100	none	0-100 cm: Sandy loam to 20cm above termination (clay)	shovel limit
62	108	40	0-40 cm: modern debris	0-40 cm: Fine to medium sandy silt, 25% subangular large gravels and small cobbles, modern debris found at 0-30 cmbs, terminated due to large slab of concrete	Concrete obstruction
63	125	40	0-40 cm: modern debris	0-40 cm: Pure modern trash layer, car parts, metal and rubber	trash
64	125	100	none	0-100 cm: Sandy loam to 20cm above termination (clay), oxidation, cobbles	shovel limit
65	191	90	none	0-90 cm: Silty clay loam, mottled clay, no pebbles greater than 1cm	pooling water
66	191	90	none	0-30 cm: Plow zone, dark brown, slightly sandy silt, moist, few medium pebbles; 30-90 cm: Grayish brown silty fine sand, oxidized, water seeped in at 90 cmbs	pooling water
67	191	90	none	0-40 cm: Plow zone, brown sandy silt, few small pebbles, wet, clear boundary; 40-90 cm: Grayish brown slightly silty fine sand with red oxidation staining, compact and wet	pooling water
68	191	85	none	0-85 cm: Silty clay loam, mottled clay, no pebbles greater than 1cm	pooling water
69	191	80	none	0-80 cm: Silty clay loam, mottled clay, no pebbles greater than 1cm	pooling water
70	191	90	none	0-30 cm: Plow zone, brown sandy silt, moist, less and 1% small to medium pebbles; 30-90 cm: Gray silty fine sand, oxidized, moist, water seeped in at 90 cmbs	pooling water
71	191	85	none	0-85 cm: Silty clay loam, mottled clay, no pebbles greater than 1cm	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
72	191	100	none	30-cm cm: Plow zone, brown slightly sandy silt, moist; 30-80 cm: Grayish brown fine sandy silt, oxidation present, mottling present, moist; 80-100 cm: Gray fine to medium sand, moist, oxidation present	shovel limit
73	191	80	none	0-80 cm: Silty clay loam, mottled clay, no pebbles greater than 1cm	pooling water
74	191	90	none	0-40 cm: Plow zone, brown slightly silty fine sand, few small pebbles, wet, clear boundary; 40-90 cm: Grayish brown slightly silty, fine sand with red oxidation, wet	pooling water
75	190	80	none	0-30 cm: Dark silty clay loam; 30-80 cm: Gray mottled clay	pooling water
76	190	100	none	0-40 cm: Plow zone, brown slightly sandy silt, few, small pebbles, clear boundary; 40-100 cm: Grayish brown slightly silty fine sand with oxidation, wet	shovel limit
77	190	90	none	0-30 cm: Dark silty clay loam; 30-90 cm: Gray mottled clay	pooling water
78	190	90	none	0-20 cm: Brown slightly sandy silt, moist; 20-80 cm: Grayish brown silt with trace fine sand; 80-90 cm: This level was an organic layer, probably peat, terminated at water level	pooling water
79	190	100	none	0-30 cm: Dark silty clay loam; 30-100 cm: Gray mottled clay	pooling water
80	190	100	20-40 cm: plastic, cut wood	0-40 cm: Plow zone, brown slightly sandy silt, few small pebbles, wavy boundary; 40-100 cm: Grayish brown slightly silty fine sand with oxidation	shovel limit
81	190	100	none	0-35 cm: Plow zone, brown silt with fine sand; 35-85 cm: Grayish silt with fine sand, oxidation present, a thin layer of charcoal at 40 cmbs; 85-100 cm: Gray fine to medium sand, oxidation present, moist	shovel limit
82	190	100	none	0-30 cm: Dark silty clay loam; 30-100 cm: Gray mottled clay	pooling water
83	190	90	none	0-45 cm: Plow zone/Ap horizon, brown clayey silt, disturbed plow zone, lower boundary is clear and smooth; 45-70 cm: B horizon, gray very fine sad with common dark yellow mottles, clear and wavy boundary; 70-90 cm: Organic layer, not fully decomposed, appears to be mostly leaves, water table is at this layer	pooling water
84	190	90	none	0-34 cm: Plow zone/Ap horizon, brown clayey silt, disturbed plow zone, lower boundary is clear and smooth; 34-90 cm: B horizon, gray very fine sad with common dark yellow mottles, clear and wavy boundary;	pooling water
85	190	100	none	0-30 cm: Brown silt with trace fine sand, medium peds, friable; 30-100 cm: Grayish brown slightly sandy silt, oxidation present, mottled, medium peds, friable, moist	shovel limit
86	190	80	none	0-30 cm: Plowed, dark clay loam; 30-80 cm: Mottled gray clay with oxidation	pooling water
87	190	62	none	0-43 cm: Gravelly, dark brown clayey silt, very few small rounded to subrounded pebbles, clear and wavy boundary; 43-62 cm: Dark brown gray silty clay, clay clumps together	pooling water
88	190	75	none	0-40 cm: Brown silty loam, compact; 40-75 cm: Mottled light brown and gray clay, moist	pooling water
89	190	80	none	0-50 cm: Brown clay loam, wet, compact; 50-80 cm: Mottled light brown and gray clay, high moisture content	pooling water
90	190	80	none	0-30 cm: Plowed, dark clay loam, very few pebbles; 30-80 cm: Mottled gray clay with oxidation	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
91	190	80	none	0-30 cm: Plow zone, brown silt with trace fine sand, no pebbles, friable; 30-80 cm: Brown slightly sandy silt, red oxidation, friable, moist	pooling water
92	190	101	none	0-44 cm: Gravelly, dark brown fine clayey silt, very few very small rounded to subrounded pebbles, clear and wavy boundary; 44-101 cm: Dark brown and gray silty clay, soft water at bottom 5 cm	shovel limit
93	190	100	none	0-32 cm: Gravelly, dark brown clayey silt, very few small subrounded pebbles, clear and wavy boundary; 32-75 cm: Dark brown and gray fine silty clay, clear and wavy boundary; 75-100 cm: Dark gray medium to coarse sandy silt	shovel limit
94	190	102	none	0-38 cm: Gravelly, dark brown fine clayey silt, very few small subrounded pebbles, clear and wavy boundary; 38-66 cm: Dark brown and gray fine silty clay, clay clumps into balls, clear and smooth boundary; 66-102 cm: Dark gray silty medium sand	shovel limit
95	190	100	none	0-30 cm: Plow zone, brown silt with trace fine sand, medium friable peds; 30-80 cm: Grayish brown slightly sandy silt, oxidation present, mottling present, moist, friable; 80-100 cm: Gray fine sand with oxidation	shovel limit
96	190	90	0-20 cm: plastic fragment	0-30 cm: Plow zone, brown silt with trace fine sand, no pebbles, friable; 30-90 cm: Brown silty fine sand, red oxidation, friable, moist	pooling water
97	190	90	none	0-30 cm: Plow zone, brown silty fine sand, moist, medium peds, friable; 30-90 cm: Grayish brown silty fine sand, oxidation present, moist	pooling water
98	190	80	none	0-30 cm: Plowed, dark clay loam, few pebbles; 30-80 cm: Mottled gray clay with oxidation	pooling water
99	190	77	0-60 cm: modern glass	0-60 cm: Clay loam, wet; 60-77 cm: Brown and gray silty clay, high moisture content	pooling water
100	190	71	none	0-43 cm: Silt loam, brown, black organic soil inclusions; 43-71 cm: Mottled light brown and gray silty clay	pooling water
101	189	50	none	0-30 cm: Dark clay loam, plowed, no pebbles; 30-50 cm: Mottled gray clay with oxidation	pooling water
102	189	47	none	0-20 cm: Brown silty loam, wet; 20-47 cm: Mottled light brown and gray clay, wet	pooling water
103	189	43	none	0-25 cm: Brown silty loam, wet; 25-43 cm: Light brown and gray mottled clay, wet	pooling water
104	189	40	none	0-30 cm: Plowed, dark clay loam; 30-40 cm: Mottled clay	pooling water
105	189	40	none	0-30 cm: Plowed, dark clay loam; 30-40 cm: Mottled clay	pooling water
106	206	102	41-82 cm: 1 clear glass fragment	0-41 cm: Gravelly, dark brown clayey silt, few small to large subangular to subrounded pebbles, clear and smooth boundary; 41-82 cm: Dark gray and brown fine silty clay, clear and wavy boundary; 82-102 cm: Dark gray medium to coarse sand	shovel limit
107	206	101	none	0-38 cm: Gravelly, dark brown clayey silt, very few small subrounded pebbles, clear and wavy boundary; 38-89 cm: Gravelly, dark brown and gray silty clay, few small to medium rounded to subrounded pebbles, gradual and smooth boundary; 89-101 cm: Dark gray silty medium to coarse sand	shovel limit
108	206	100	none	0-44 cm: Brown loamy silt, organic black inclusions; 44-100 cm: Light brown and gray mottled silt loam	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
109	206	100	0-30 cm: modern debris	0-30 cm: Brown silty loam, organic black inclusions; 30-100 cm: Sandy loam, light brown and gray, mottled	shovel limit
110	206	100	0-30 cm: modern debris	0-30 cm: Brown silty loam, organic black inclusions; 30-100 cm: Mottled light brown and gray sandy loam, wet	shovel limit
111	206	103	none	0-49 cm: Gravelly, dark brown clayey silt, very few small to large subrounded pebbles, clear and wavy boundary; 49-68 cm: Brown and gray fine silty clay, abrupt and smooth boundary; 68-103 cm: Dark gray silty medium to coarse sand	shovel limit
112	206	110	none	0-40 cm: Dark plowed clay loam; 40-50 cm: Mottled clay; 50-110 cm: Gray mottled sand	shovel limit
113	206	100	none	0-40 cm: Plow zone; 40-70 cm: Mottled clay; 70-80 cm: Red oxidation layer, large cobble in sidewall; 80-100 cm: Gray sand	shovel limit
114	206	110	none	0-40 cm: Plow zone; 40-80 cm: Mottled clay; 80-110 cm: Gray sand, two bands of clay approximately 5 cm thick	shovel limit
115	206	110	none	0-30 cm: Plow zone; 30-60 cm: Mottled clay; 60-85 cm: Dark blueish gray sand, oxidized; 85-110 cm: Dark blueish gray sand	shovel limit
116	206	100	44-65 cm: 1 glass fragment	0-44 cm: Gravelly, dark brown clayey silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 44-65 cm: Gravelly, brown and gray fine silty clay, very few subrounded pebbles, clear and smooth boundary; 65-100 cm: Dark gray with some brown silty medium to coarse sand	shovel limit
117	206	100	none	0-50 cm: Plow zone, brown slightly silty fine sand, few small pebbles to small cobbles, no roots, friable, clear boundary; 50-100 cm: Grayish brown fine sand with oxidation, compact, terminated due to depth	shovel limit
118	206	100	none	0-35 cm: Plow zone, silt with fine sand, medium peds; 35-80 cm: Grayish brown slightly silty sand, oxidation present; 80-100 cm: Gray fine sand, oxidation present, moist	shovel limit
119	206	100	none	0-30 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable, wavy boundary; 30-80 cm: Grayish brown fine sand with some silt, oxidation present, compact; 80-100 cm: Grayish brown fine sand, oxidation present	shovel limit
120	206	100	0-20 cm: 1 washer, 1 wire nail fragment, 30 cm: 1 milk glass fragment	0-25 cm: Brown, slightly sandy silt, plow zone, medium and firm peds; 25-80 cm: Grayish brown fine sand in silt, oxidation, medium peds; 80-100 cm: Gray oxidized fine sand, trace silt	shovel limit
121	206	105	27-69 cm: brown, clear, and green glass fragments	0-27 cm: Gravelly, dark brown fine clayey silt, common small to large subrounded to angular pebbles, clear and wavy boundary; 27-69 cm: Gravelly, brown fine silty clay, common small to medium subrounded pebbles, clear and smooth boundary; 69-105 cm: Gravelly, gray medium to coarse silty sand	shovel limit
122	190	100	0-25 cm: modern debris	0-25 cm: 3% semi rounded gravels, 1 medium cobble; 25-40 cm: Mottled yellowish brown sand and light brown silty loam, 1% gravels, semi rounded; 40-100 cm: Compact gray silty loam	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
123	190	100	0-45 cm: modern debris	0-45 cm: Brown silt loam, 1% semi rounded gravels, wavy boundary; 45-100 cm: Mottled gray and light brown sandy loam, very few gravels	shovel limit
124	190	103	0-36 cm: modern debris	0-36 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear smooth boundary; 36-78 cm: Gray fine silty clay (some brown discoloration), clear and smooth boundary; 78-103 cm: Dark gray medium to coarse silty sand	shovel limit
125	190	100	none	0-29 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 29-79 cm: Gravelly, gray (some brown) fine sandy clay, very few medium subrounded pebbles, clear and smooth boundary; 79-100 cm: Dark gray medium to coarse silty sand	shovel limit
126	190	110	0-44 cm: 5cm long nail (modern)	0-44 cm: Gravelly, dark brown fine sandy silt, common very small subrounded pebbles, clear and wavy boundary; 44-110 cm: Light gray silty medium to coarse sand	shovel limit
127	190	103	none	0-31 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 31-103 cm: Dark gray to gray silty medium sand	shovel limit
128	190	100	none	0-35 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable, wavy boundary; 35-80 cm: Grayish brown slightly silty fine sand with oxidation, wet, compact, clear boundary; 80-100 cm: Dark gray medium sand, wet, compact	shovel limit
129	190	100	none	0-40 cm: Brown silt loam, less than 1% gravels, compact; 40-70 cm: Mottled light brown and gray sandy loam, compact, 3% semi rounded gravels, poorly sorted; 70-100 cm: Grayish brown silty sand, few gravels	shovel limit
130	190	100	none	0-40 cm: Plow zone, brown slightly silty fine sand, few small pebbles, no roots, friable, wavy boundary; 40-100 cm: Grayish brown medium sand, oxidation, wet, compact	shovel limit
131	190	110	none	0-20 cm: Plow zone; 20-23 cm: light yellowish brown sand lens; 23-35 cm: Dark brown clay; 35-55 cm: Mottled sandy clay; 55-110 cm: Dark grayish blue sandy clay	shovel limit
132	190	95	none	0-45 cm: Plow zone; 45-70 cm: Mottled clay; 70-95 cm: Gray sandy clay	shovel limit
133	190	95	none	0-30 cm: Plow zone; 30-50 cm: Mottled clay; 50-95 cm: Dark sand	shovel limit
134	190	100	none	0-34 cm: Brown silt loam, less than 1% gravels, semi rounded; 34-72 cm: Mottled grayish light brown sandy loam; 72-100 cm: Dark brown grayish medium sand	shovel limit
135	190	100	42-68 cm: 1 green glass fragment	0-42 cm: Gravelly, dark brown fine sandy silt, few small to medium subrounded pebbles, clear and wavy boundary; 42-68 cm: Gray fine clayey sand, clear and smooth boundary; 68-100 cm: Dark gray medium to coarse silty sand	shovel limit
136	190	102	none	0-28 cm: Gravelly dark brown fine sandy silt, few small to large rounded to subrounded pebbles, clear and wavy boundary; 28-89 cm: Gray medium sandy clay, clear and smooth boundary; 89-102 cm: Dark gray medium to coarse silty sand	shovel limit
137	190	60	none	0-40 cm: Plow zone, brown slightly silty fine sand, friable, diffuse boundary; 40-60 cm: Gray slightly sandy silt with oxidation, wet, compact	pooling water
138	190		none	0-57 cm: Brown silty loam, wet, oxidation present	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
139	190	70	none	0-70 cm: Plow zone, brown silty fine sand, wet and friable, becomes gray and oxidized as depth increases	pooling water
140	190	70	none	0-70 cm: Dark brown silty loam, wet, woody debris at 50 cmbs	pooling water
141	190	80	none	0-80 cm: Plow zone, brown silty fine sand, few very small pebbles, wet, friable, becomes gray and oxidized as depth increases	pooling water
142	190	80	none	0-50 cm: Brown silty sand, no gravels, wet; 50-80 cm: Dark gray medium sand, mottled light brown	pooling water
143	190	100	none	0-50 cm: Plow zone, brown silty fine sand, friable, clear boundary; 50-100 cm: Dark gray medium sand, wet, compact, water at 100 cmbs	shovel limit
144	190	95	none	0-40 cm: Plow zone; 40-95 cm: Mottled silty clay	pooling water
145	190	75	none	0-30 cm: Plow zone; 30-70 cm: Mottled clay; 70-75 cm: Dark clay	pooling water
146	190	70	none	0-30 cm: Plow zone; 30-70 cm: Mottled clay	pooling water
147	190	75	none	0-35 cm: Plow zone; 35-75 cm: Mottled silty clay	pooling water
148	190	75	none	0-35 cm: Plow zone; 35-75 cm: Mottled silty clay	pooling water
149	190	65	none	0-30 cm: Plow zone; 30-60 cm: Mottled silty clay	pooling water
150	190	50	none	0-30 cm: Plow zone; 30-50 cm: Mottled silty clay	pooling water
151	190	75	none	0-40 cm: Plow zone; 40-75 cm: Mottled silty clay	pooling water
152	211	100	none	0-40 cm: Gravelly, dark brown fine sandy silt, few small to medium pebbles, clear and wavy boundary; 40-68 cm: Dark gray clayey fine sand, very few small subrounded to rounded pebbles, clear and smooth boundary; 68-100 cm: Dark gray medium silty sand	shovel limit
153	211	90	none	0-29 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 29-90 cm: Dark gray medium sandy clay	pooling water
154	211	76	none	0-35 cm: Gravelly, dark brown fine sandy silt, few small to medium subrounded pebbles, clear and wavy boundary; 35-76 cm: Dark gray fine sandy clay, few small to medium rounded to subrounded pebbles, log in side of the shovel probe	pooling water
155	211	71	none	0-43 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, few rootlets to fine roots, moist, clear and wavy boundary; 43-71 cm: Dark gray fine to medium sandy clay, very few very small subrounded pebbles, few small to medium woodchips	pooling water
156	211	97	none	0-27 cm: Gravelly, dark brown fine sandy silt, very moist, few small to medium subrounded pebbles, clear and smooth boundary; 27-97 cm: Dark gray fine silty clay, few pieces of charcoal 2-3 cm in length	shovel limit
157	211	70	none	0-40 cm: Plow zone, brown slightly silty fine sand, no pebbles, wet, compact, clear boundary; 40-70 cm: Gray silt with oxidation, inundated, woody fragments preserved	pooling water
158	211	80	none	0-38 cm: Brown silty sand, compact, wet; 38-70 cm: Grayish brown silty sand, compact, wet; 70-80 cm: Peat, dark brown silty loam, organic, wet	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
159	211	80	none	0-40 cm: Plow zone, brown slightly silty fine sand, no pebbles, wet, compact, diffuse to gradient boundary; 40-80 cm: Grayish brown medium sand, wet, compact, woody debris	pooling water
160	211	51	none	0-51 cm: Brown silty fine sand, compact, less than 1% gravels	pooling water
161	211	52	none	0-52 cm: Brown silty fine sand, compact, less than 1% gravels	pooling water
162	211	90	none	0-30 cm: Plow zone, brown silty fine sand, few very small pebbles, wet, friable, diffuse boundary; 30-90 cm: Gray medium sand, wet, compact	pooling water
163	211	98	none	0-30 cm: Light brown fine silty loam; 30-98 cm: Gray and brown oxidized sandy loam, wet, water at 90 cmbs	shovel limit
164	211		none	0-35 cm: Plow zone and dark loamy soil with sand; 35-55 cm: Mottled, hard packed silty clay; 55-75 cm: Wet, gray sand	shovel limit
165	211	75	none	0-30 cm: Plow zone, dark brown loamy soil; 30-40 cm: Light brown, hard packed clayey silt, mottled; 40-75 cm: Dark wet sand	shovel limit
166	211	50	none	0-30 cm: Plow zone; 30-50 cm: Hard packed mottled clay	pooling water
167	211	70	none	0-30 cm: Plow zone; 30-70 cm: Hard packed mottled clay, charcoal, partially burned woody debris, organic wetland deposit	pooling water
168	211	70	none	0-23 cm: Gravelly, dark brown fine sandy silt, few very small to small rounded to subrounded pebbles, clear and wavy boundary; 23-70 cm: Grayish brown fine to medium sandy silt, woody debris present	pooling water
169	211	78	none	0-29 cm: Gravelly, dark brown fine sandy silt, few small to medium subrounded to subangular pebbles, clear and wavy boundary; 29-61 cm: Grayish brown fine to medium sandy silt, clear and smooth boundary; 61-78 cm: Dark gray silty medium to coarse sand	pooling water
170	211	97	none	0-35 cm: Gravelly, dark brown sandy silt, common small to medium rounded to subangular pebbles, few pieces of woody debris in the upper 5 cm, clear and wavy boundary; 35-97 cm: Gray and brown fine medium sandy silt	shovel limit
171	211	102	none	0-25 cm: Gravelly, dark brown fine sandy silt, common small to large rounded to subrounded pebbles, concrete chunk in lower boundary, clear and wavy boundary; 25-78 cm: Gravelly, brown and gray fine sandy silt, few small to medium rounded to subrounded, pebbles, clear and smooth boundary; 78-102 cm: Dark gray silty fine to medium sand	shovel limit
172	211	100	none	0-36 cm: Gravelly, dark brown fine sandy silt, common small to large rounded to subrounded pebbles, very few small cobbles, clear and wavy boundary; 36-69 cm: Gravelly, gray and brown silty fine to medium sand, very few very small pebbles, clear and smooth boundary; 69-100 cm: Dark gray silty medium to coarse sand	shovel limit
173	211	102	none	0-32 cm: Gravelly, dark brown fine sandy silt, common small to large rounded to subrounded pebbles, clear and wavy boundary; 32-39 cm: Gray and brown fine sandy clay, clear and smooth boundary; 39-102 cm: Dark gray medium to coarse clayey sand	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
174	211	100	none	0-39 cm: Gravelly, dark brown fine sandy silt, common small to medium rounded to subrounded pebbles, clear and wavy boundary, 39-59 cm: Gray and brown fine to medium sandy clay, few small pieces of wood, clear and wavy boundary; 59-100 cm: Dark gray medium to coarse silty sand	shovel limit
175	211	100	none	0-32 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 32-40 cm: Gray and brown fine sandy clay, clear and wavy boundary; 40-93 cm: Dark gray medium to coarse sand	pooling water
176	211	100	none	0-50 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable, clear boundary; 50-100 cm: Grayish brown silty fine sand with oxidation, wet, compact	shovel limit
177	211	100	none	0-35 cm: Plow zone; 35-60 cm: Dark silty clay; 60-70 cm: Dark mottled clay; 70-100 cm: Dark gray silty clay	shovel limit
178	211	80	none	0-30 cm: Plow zone; 30-80 cm: Dark silty clay	pooling water
179	211	110	30-55 cm: "J" shaped metal fragment, 1 small ceramic fragment	0-30 cm: Plow zone; 30-55 cm: Hard packed, dark silty clay; 55-80 cm: Light gray silty clay with some mottling; 80-110 cm: Light blueish gray sand	shovel limit
180	211	80	none	0-35 cm: Plow zone, roots and duff from edge of the field; 35-50 cm: Mottled silty clay; 50-80 cm: Gray silty clay	shovel limit
181	211	95	none	0-20 cm: Brown silt loam, less than 1% semi rounded gravels, compact, wet; 20-95 cm: Grayish brown silt with oxidation, compact, moist	shovel limit
182	211	100	0-25 cm: plastic fragment	0-25 cm: Plow zone, brown slightly silty fine sand, no pebbles, friable, wood fragments, clear boundary; 25-50: Gray silt with 70% woody fragments; 50-100 cm: Gray slightly sandy silt with oxidation, wet, compact	shovel limit
183	211	100	none	0-20 cm: Light brown to brown silty loam, medium pebbles, semi rounded, compact; 20-100 cm: Gray silty loam, less than 1% semi rounded gravels, compact, wet	shovel limit
184	211	100	none	0-55 cm: Plow zone, brown silty fine sand, few small pebbles, friable, clear boundary; 55-100 cm: Gray fine sand with oxidation, no pebbles, wet, compact	shovel limit
185	211	75	none	0-24 cm: Brown silty loam, no gravels; 24-75 cm: Brown and gray silty sand, oxidation inclusions, compact, wet	pooling water
186	211	87	none	0-37 cm: Gravelly, dark brown fine sandy silt, few small to large rounded to subrounded pebbles, clear and wavy boundary; 37-87 cm: Dark gray fine to medium sandy clay, few small to medium rounded to subrounded pebbles, few pieces of decaying wood	pooling water
187	211	100	none	0-30 cm: Light brown silt loam, less than 5% gravels, poorly sorted, small cobbles to large pebbles; 30-35 cm: Coarse yellowish brown sand, 10% poorly sorted gravels; 35-100 cm: Dark brown silt loam, compact, very few gravels	shovel limit
188	211	90	none	0-40 cm: Plow zone, slightly silty fine sand, few small pebbles, friable, wavy boundary; 40-90 cm: Dark gray medium sand, wet, compact	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
189	211	70	none	0-30 cm: Plow zone; 30-50 cm: Light hard packed silty clay; 50-70 cm: Dark sandy silt, organics and charcoal	pooling water
190	211	62	none	0-20 cm: Brown silt loam, wet, compact, less than 1% gravels; 20-50 cm: Light gray and brown silty loam, wet, oxidation present, small woody debris; 50-62 cm: Dark brown and black fine sandy loam	pooling water
191	211	70	none	0-50 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable, clear boundary; 50-70 cm: Dark gray medium sand, wet	pooling water
192	211	65	none	0-30 cm: Plow zone; 30-40 cm: Hard silty clay; 40-65 cm: Decomposing wood and organics	pooling water
193	211	40	none	0-40 cm: Silt loam, wet, brown	pooling water
194	211	70	none	0-30 cm: Plow zone, one large cobble; 30-45 cm: Hard packed silty clay; 45-70 cm: Organic layer, decomposing wood fragments	pooling water
195	211	75	none	0-30 cm: Plow zone; 30-50 cm: Hard packed light gray silty clay; 50-75 cm: Buried organic horizon, decomposing woody debris	pooling water
196	211	40	0-20 cm: 2 ceramic fragments	0-40 cm: Plow zone, brown slightly silty fine sand, few small pebbles, wet	pooling water
197	211	68	0-30 cm: 1 milk glass fragment; 30-60 cm: 1 clear glass fragment	0-68 cm: Brown silty loam, wet compact	pooling water
198	211	65	none	0-30 cm: Plow zone, brown slightly silty fine sand, friable; 30-65 cm: Gray silty fine sand, oxidized, compact	pooling water
199	211	53	none	0-30 cm: Brown silty loam, wet, compact, no gravels; 30-53 cm: Gray and brown silt loam, compact, wet, no gravels, no organics, oxidation present	pooling water
200	211	90	none	0-30 cm: Plow zone; 30-40 cm: Hark packed silty clay; 40-65 cm: Gray sand; 65-90 cm: Decomposing wood and organics	pooling water
201	211	90	none	0-35 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable, clear boundary; 35-60 cm: Gray silty fine sand with oxidation, wet, compact, clear boundary; 60-90 cm: Dark gray medium sand, wet	pooling water
202	211	75	none	0-30 cm: Plow zone; 30-40 cm: Hark packed silty clay; 40-75 cm: Gray sand	pooling water
203	211	60	none	0-30 cm: Plow zone; 30-40 cm: Hark packed silty clay; 40-60 cm: Gray sand	pooling water
204	211	97	none	0-37 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and smooth boundary; 37-97 cm: Dark gray silty medium to coarse sand	shovel limit
205	211	101	none	0-41 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subangular pebbles, clear and smooth boundary; 41-101 cm: Dark gray silty medium to coarse sand, some decaying plant material near upper boundary,	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
206	211	100	none	0-41 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subangular pebbles, clear and smooth boundary; 41-100 cm: Dark gray silty medium to coarse sand, some decaying plant material near upper boundary,	shovel limit
207	211	104	none	0-43 cm: Gravelly, dark brown clayey silt, few small to medium rounded to subrounded pebbles, clear and smooth boundary; 43-104 cm: Dark gray silt medium to coarse sand	shovel limit
208	211	104	0-36 cm: modern debris	0-36 cm: Gravelly, dark brown clayey silt, few small to large rounded to subangular pebbles, clear and wavy boundary; 36-104 cm: Dark gray silty medium to coarse sand	shovel limit
209	211	51	none	0-24 cm: Gravelly, dark brown fine sandy silt, common small to medium rounded to subrounded pebbles, clear and wavy boundary; 24-51 cm: Gray and brown fine to medium sandy clay, increasing compaction	compaction
210	211	100	0-100 cm: concrete chunks	0-29 cm: Gravelly, dark brown fine sandy silt, common small to medium rounded to subrounded pebbles, clear and wavy boundary; 29-100 cm: Dark gray silty medium to coarse sand, few small pieces of wood 2-5 cm in length, one piece of wood is milled	shovel limit
211	211	87	none	0-38 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subangular pebbles, clear and smooth boundary; 38-87 cm: Dark gray medium to coarse silt sand	pooling water
212	211	100	0-39 cm: concrete chunks	0-39 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subangular pebbles, few small pieces of wood, clear and smooth boundary; 39-100 cm: Dark gray medium to coarse silt sand	pooling water
213	210	90	none	0-30 cm: Plow zone, few pebbles; 30-90 cm: Mottled silty clay with oxidation	pooling water
214	214	100	none	0-30 cm: Plow zone, few pebbles; 30-100 cm: Mottled silty clay sand with oxidation	shovel limit
215	210	90	none	0-30 cm: Plow zone, few pebbles; 30-90 cm: Mottled silty clay	pooling water
216	210	85	none	0-30 cm: Plow zone; light brownish silt loam; 30-85 cm: Light grayish brown silt loam, oxidation present	pooling water
217	214	75	0-30 cm: modern debris	0-30 cm: Plow zone, pebbles; 30-75 cm: Mottled silty clay sand, oxidation, decomposing wood	pooling water
218	214	80	none	0-40 cm: Plow zone, brown slightly silty fine sand, few small pebbles, friable; 40-80 cm: Gray slightly sandy silt with oxidation, wet, compact	pooling water
219	214	101	none	0-46 cm: Gravelly dark brown fine sandy silt, few subrounded small to medium pebbles, clear and smooth boundary; 46-101 cm: Gray and brown fine sandy clay, few small pieces of wood	shovel limit
220	214	58	none	0-30 cm: Plow zone, light brown silty loam, no gravels, wet, compact; 30-58 cm: Grayish brown silty loam, no gravels, oxidation present	pooling water
221	214	86	none	0-36 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subangular pebbles, clear and smooth boundary; 35-86 cm: Gray and brown silty fine to medium sandy clay, few very small to small rounded pebbles, few small pieces of wood	pooling water
222	214	80	none	0-30 cm: Plow zone, some pebbles; 30-80 cm: Mottled silty clay sand with oxidation	pooling water
223	214	75	none	0- 30 cm: Plow zone; 30-75 cm: Silty clay with some sand, oxidized, few pebbles	pooling water

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
224	214	73	none	0-38 cm: Gravelly, dark brown fine silt, few small to medium rounded to subangular pebbles, clear and wavy boundary; 38-73 cm: Gray and brown fine to medium sandy clay	pooling water
225	214	100	none	0-42 cm: Gravelly, dark brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and smooth boundary; 42-100 cm: Gray and brown fine sandy clay, few small pieces of decomposing wood	shovel limit
226	214	91	none	0-42 cm: Gravelly, dark brown fine sandy silt, common small to large rounded to subrounded pebbles, few rootlets, clear and wavy boundary; 42-91 cm: Gray and brown fine sandy clay	pooling water
227	214	80	none	0-30 cm: Plow zone; 30-80 cm: Silty clay, oxidized, some sand	pooling water
228	214	70	0-20 cm: glass fragment	0-70 cm: Plow zone, brown slightly silty fine sand, no pebbles, friable, encountered a large concrete parking barrier	concrete obstruction
229	214	100	none	0-35 cm: Brown silt loam, 10% gravels, semi rounded large pebbles to small cobbles; 35-100 cm: Grayish brown silt loam, oxidation, few semi rounded gravels	shovel limit
230	214	100	none	0-48 cm: Gravelly, dark brown fine sandy silt, common small to large rounded to subrounded pebbles, few subrounded small to medium cobbles, few rootlets to fine roots, clear and smooth boundary; 48-100 cm: Gray and brown fine sandy clay, very few small rounded pebbles	shovel limit
231	214	100	0-90 cm: modern debris	0-100 cm: Uniform silty loam, small cobbles	shovel limit
232	218	90	none	0-40 cm: Brown silt loam, no gravels, black organics; 40-90 cm: Brownish gray silt loam, oxidation present	pooling water
233	218	90	none	0-70 cm: Brown slightly silty fine sand, no pebbles, few rootlets, clear boundary; 70-90 cm: Gray slightly sandy silt with oxidation, wet, compact	pooling water
234	218	75	none	0-15 cm: Roots and grass; 15-55 cm: Dark hard packed silt loam; 55-75 cm: Decomposing wood and organics	pooling water
235	218	100	none	0-46 cm: Dark brown fine sandy silt, few rootlets to fine roots, clear and smooth boundary; 46-77 cm: Gray medium fine sandy clay, few very small subrounded pebbles, clear and wavy boundary; 77-100 cm: Brown fine sandy silt, many decomposed wood	shovel limit
236	210	65	none	0-25 cm: Fill, gravelly, grayish brown coarse sand, gravels are small angular pebbles, large asphalt chunks and modern debris, abrupt and smooth lower boundary, gravels are imported; 25-33 cm: Buried A horizon, disturbed or redeposited, dark brown silty fine sand, organic soil, abrupt and smooth lower boundary; 33-65 cm: Fill or redeposited creek gravels, gravelly, light brown coarse sand, rounded to subrounded small to large pebbles, very compact, compaction is increasing with depth, this area was built up as an access road	compaction
237	227	100	none	0-100 cm: Fill, tan silt, mottled, no gravels, many rootlets and large roots, compact	shovel limit
238	227	100	none	0-20 cm: Sandy loam; 20-80 cm: Mottled sand; 80-100 cm: Dark gray coarse sand	shovel limit
239	227	105	none	0-63 cm: Brown fine to medium sandy silt, few rootlets, clear and diffuse boundary; 63-105 cm: Light gray and brown medium silty sand	shovel limit
240	227	100	none	0-30 cm: Sandy loam, dark brown, plow zone; 30-100 cm: Mottled sand	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
241	227	102	none	0-53 cm: Brown fine to medium sandy silt, few rootlets, clear and diffuse boundary; 53-102 cm: Light gray and brown fine silty sand	shovel limit
242	227	100	none	0-100 cm: Light brown and gray silt loam, oxidation present	shovel limit
243	227	100	none	0-30 cm: Sandy loam, plow zone; 30-60 cm: Mottled sand; 60-70 cm: Light gray compact silt, oxidation; 70-100 cm: Mottled sand	shovel limit
244	231	103	none	0-51 cm: Brown fine to medium sandy silt, very few rootlets, gradual and clear boundary; 51-103 cm: Light gray and brown very fine to fine silty sand	shovel limit
245	231	100	none	0-40 cm: Brown slightly silty fine sand, few rootlets, no gravels, friable, wavy boundary; 40-100 cm: Grayish brown medium sand, mottled with oxidation, compact	shovel limit
246	231	100	none	0-30 cm: Plow zone; 30-80 cm: Sandy silt, mottled; 80-100 cm: Coarse gray sand	shovel limit
247	231	101	none	0-59 cm: Brown fine to medium sandy silt, few clumps of gray clay near boundary, clear and gradual boundary; 59-101 cm: Light gray and brown silty sand	shovel limit
248	231	100	none	0-30 cm: Brown silt loam; 30-100 cm: Brown and gray mottled medium sandy loam, oxidation, large band of orange oxidation	shovel limit
249	231	100	none	0-30 cm: Plow zone; 30-70 cm: Mottled sandy silt; 70-100 cm: Sands	shovel limit
250	231	102	none	0-49 cm: Brown fine to medium sandy silt, few rootlets, clear and gradual boundary; 49-102 cm: Light gray and brown fine to very fine sand	shovel limit
251	231	100	0-20 cm: plastic fragments	0-40 cm: Brown slightly silty fine sand, no pebbles, few rootlets, friable, wavy boundary; 40-100 cm: Grayish brown medium sand, mottled with oxidation, compact, 2 cm black layer of medium sand at 70 cmbs	shovel limit
252	231	100	none	0-30 cm: Plow zone; 30-60 cm: Compact silt; 60-100 cm: Mottled sand	shovel limit
253	231	103	none	0-51 cm: Brown fine to medium sandy silt, clear and gradual boundary; 51-103 cm: Light gray and brown very fine sand	shovel limit
254	231	100	none	0-33 cm: Brown silt loam, some fine sand, no gravels, small roots; 33-100 cm: Grayish brown silty sand, oxidation present, no gravels, black organic inclusions	shovel limit
255	231	100	none	0-30 cm: Plow zone; 30-70 cm: Hard packed silt; 70-75 cm: Dark organic layer; 75-100 cm: sand	shovel limit
256	231	103	none	0-48 cm: Brown fine to medium sandy silt, clear to gradual boundary; 48-103 cm: Light gray and brown very fine sand	shovel limit
257	231	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled silty sandy loam; 50-52 cm: Organic layer; 52-100 cm: Mottled sandy silt	shovel limit
258	231	100	0-30 cm: modern debris	0-30 cm: Plow zone; 30-50 cm: Mottled silty sandy loam; 50-52 cm: Organic layer; 52-100 cm: Mottled sandy silt	shovel limit
259	231	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled silty sandy loam; 50-54 cm: Organic layer; 54-100 cm: Mottled sandy silt	shovel limit
260	227	100	none	0-10 cm: Dark brown organic silt loam, fine roots to medium roots; 10-100 cm: Light brown and gray mottled sandy loam, oxidation present	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
261	227	102	none	0-57 cm: Gravelly, brown fine sandy silt, few very small subangular to subrounded pebbles, common fine to medium roots, clear and smooth boundary; 57-102 cm: Brownish gray fine to medium silty sand, few fine roots	shovel limit
262	227	100	none	0-47 cm: Gravelly, brown fine sandy silt, very few small subangular pebbles, common fine roots, gradual and wavy boundary; 47-100 cm: Light brownish gray fine to medium silty sand, few rootlets, few small pieces of charcoal (2-4 cm long)	shovel limit
263	227	100	none	0-70 cm: Light brownish gray slightly silty fine sand, mottled with oxidation, roots within the upper 10 cm, compact, clear boundary; 70-100 cm: Gray medium sand mottled with oxidation, compact	shovel limit
264	227	101	none	0-43 cm: Brown fine sandy silt, common rootlets and fine roots, few medium to coarse roots, gradual and wavy boundary; 43-101 cm: Light brownish gray fine to medium silty sand, common rootlets to medium roots	shovel limit
265	223	120	none	0-5 cm: Silt loam, rootlets; 5-120 cm: Grayish brown mottled silt loam, no gravels	shovel limit
266	223	100	none	0-39 cm: Brown fine to medium sandy silt, very few fine roots, gradual and wavy boundary; 39-100 cm: Light grayish brown medium silty sand	shovel limit
267	223	100	none	0-30 cm: Brown fine to medium sandy silt, very few fine roots, gradual and wavy boundary; 30-100 cm: Light grayish brown medium silty sand	shovel limit
268	223	105	none	0-36 cm: Gravelly, brown fine sandy silt, common angular to rounded small to medium pebbles, few fine roots, gradual and wavy boundary; 35-69 cm: Compact light brown fine to medium silt, gradual wavy boundary; 69-105 cm: Dark gray medium to coarse silty sand	shovel limit
269	223	55	none	0-30 cm: Brown slightly silty fine sand, few small pebbles, angular, roots, 10 cm layer of decaying organics, clear boundary; 30-55 cm: Gray silt, very compact	compaction
270	223	90	0-40 cm: modern debris	0-40 cm: Hard packed silt and cobbles; 40-90 cm: Compact silt	pooling water
271	223	100	none	0-15 cm: Brown fine to medium sandy silt, very few small to medium subrounded pebbles, rew rootlets, clear and wavy boundary; 15-100 cm: Brownish dark gray medium to coarse silty sand, common small to large subangular to rounded pebbles	shovel limit
272		90	none	0-60 cm: Sandy silt loam, 60-65 cm: Buried A horizon, darker band of sandy silt; 65-90 cm: Sand	pooling water
273	223	100	none	0-41 cm: Brown fine sandy silt, common small to medium rounded to subangular pebbles, clear and wavy boundary; 41-100 cm: Brownish gray medium silty sand	shovel limit
274	223	77	none	0-30 cm: Medium size roots, brown silt loam, small cobbles and pebbles, less than 3% gravels, compact; 30-77 cm: Very compact silt, brown, no gravels	compaction
275	223	50	none	0-10 cm: Brown slightly silty fine sand, few small pebbles, rounded, roots, friable, clear boundary; 10-50 cm: Grayish brown silt, no gravels or roots, compact and dry	compaction

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
276	223	100	none	0-21 cm: Gravelly, brown fine sandy silt, common, angular to subrounded small to medium pebbles, few rootlets, clear and wavy boundary; 21-68 cm: Gravelly, light brown sandy silt, many small to large subrounded to angular pebbles and cobbles, compact, clear and smooth boundary; 68-100 cm: Light gray fine silty sand, very few small subrounded pebbles	shovel limit
277	223	100	none	0-25 cm: Compact silt and cobbles; 25-100 cm: Compact mottled silt with some sand towards the bottom	shovel limit
278	223	104	none	0-41 cm: Gravelly, brown fine sandy silt, very compact, common small to large angular to subrounded pebbles, few small charcoal pieces, few rootlets to fine roots, clear and wavy boundary; 41-104 cm: Light brownish gray fine to medium silty sand	shovel limit
279	223	100	none	0-40 cm: Hard packed silt and cobbles; 40-100 cm: Compact silt, charcoal and 1 FMR at 50 cmbs	shovel limit
280	223	101	none	0-24 cm: Gravelly, brown fine sandy silt, common small to large angular to subrounded pebbles, common rootlets, clear and wavy boundary; 24-65 cm: Gravelly, light brown fine sandy silt, very compact, few angular to subrounded small to large pebbles, clear and smooth boundary; 65-101 cm: Light brownish gray fine to medium silt sand	shovel limit
281	223	104	none	0-36 cm: Gravelly, light brown fine sandy silt, common small to large subrounded to angular pebbles and cobbles, clear and wavy boundary; 36-78 cm: Gravelly, dark brown fine clayey silt, few small to large subrounded to angular pebbles, clear and wavy boundary; 78-104 cm: Dark gray silty fine to medium sand, moist	shovel limit
282	222	100	0-30 cm: modern debris	0-30 cm: Light brown silt loam, 5% semi rounded poorly sorted gravels; 30-100 cm: Compact silt loam, gray with some sand, oxidized, decomposing woody debris	shovel limit
283	222	100	none	0-30 cm: Light brown slightly silty fine sand, many small to large pebbles, rounded to subangular, roots, compact, clear boundary; 30-100 cm: Fill, light brownish gray silt, dry, compact, at 60 cmbs sediment changes to a dark brown	shovel limit
284	222	75	none	0-50 cm: Fine roots, brown silt loam, 10% poorly sorted gravels, rounded medium sized pebbles, compact; 50-75 cm: Light brownish gray oxidation, silt loam, large pebbles and small cobbles, very compact	compaction
285	222	100	none	0-30 cm: Silty loam with cobbles; 30-60 cm: Compact silty loam; 60-100 cm: Mottled silty clay loam, buried organics	shovel limit
286	222	90	0-30 cm: 1 clear glass fragment	0-30 cm: Brown slightly silty fine sand, few small pebbles, rounded, roots, friable, charcoal flecking, clear boundary; 30-90 cm: Grayish brown silt mottled with oxidation, dry, compact	compaction
287	280	110	none	0-44 cm: Gravelly, brown fine sandy silt, few small to large subrounded to angular pebbles, gradual and wavy boundary; 44-110 cm: Brownish gray fine to medium silty sand	shovel limit
288	280	100	none	0-25 cm: Silt loam, brown; 25-100 cm: Brown silty sand	shovel limit
289	280	100	none	0-40 cm: Silty sandy loam, brown, few poorly sorted gravels; 40-100 cm: Gray and brown silt loam, oxidation, few gravels, black organic matter	shovel limit
290	280	100	none	0-40 cm: Brown fine sandy loam, few poorly sorted gravels, fine roots present; 40-100 cm: Brownish gray loam, few sorted gravels, oxidation present	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
291	280	100	none	0-25 cm: Brown silt loam; 25-100 cm: Brown mottled silty sand	shovel limit
292	280	100	none	0-30 cm: Brown slightly silty fine sand, no gravels, few roots, friable, diffuse boundary; 30-100 cm: Gray medium sand, mottled with oxidation, no roots, no pebbles, compact	shovel limit
293	280	105	none	0-49 cm: Gravelly, brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 49-105 cm: Dark brownish gray silty fine to medium sand	shovel limit
294	280	100	none	0-47 cm: Gravelly, brown fine sandy silt, few small to medium rounded to subrounded pebbles, clear and wavy boundary; 47-100 cm: Dark gray silty fine to medium sand	shovel limit
295	280	100	0-30 cm: glass fragment	0-30 cm: Sandy silt loam, dark brown; 30-80 cm: Silty, mottled and oxidized; 80-100 cm: Silty sand, mottled	shovel limit
296	280	100	none	0-40 cm: Plow zone; 40-46 cm: Dark sandy lens; 46-100 cm: Mottled silty sand	shovel limit
297	281	101	none	0-37 cm: Gravelly, brown fine sandy silt, few small to medium subrounded to subangular pebbles, clear and wavy boundary; 37-40 cm: Dark gray medium to coarse sand, only exists on the north wall, clear and broken boundary; 40-101 cm: Light brownish gray silty fine to medium sand	shovel limit
298	266	105	none	0-36 cm: Gravelly, brown fine sandy silt, few very small to medium rounded to subrounded pebbles, gradual and smooth boundary; 36-105 cm: Brownish gray fine to medium silty sand	shovel limit
299	266	100	none	0-30 cm: Brown slightly silty fine sand, no gravels, friable, clear boundary; 30-100 cm: Gray medium sand, mottled with oxidation, no gravels	shovel limit
300	266	110	none	0-30 cm: Plow zone; 30-110 cm: Silty sand	shovel limit
301	269	100	none	0-40 cm: Dark brown silty loam; 40-80 cm: Hard packed silty loam, brown; 80-100 cm: Mottled sand silt, gray	shovel limit
302	269	100	0-20 cm: modern debris	0-8 cm: Dark brown sandy silt loam; 8-20 cm: Coarse sand and gravels; 20-60 cm: Hard packed silt; 60-100 cm: Mottled sand	shovel limit
303	269	100	0-40 cm: concrete chunks	0-40 cm: Silty loam, hard packed; 40-80 cm: Mottled silty loam; 80-100 cm: Mottled sandy silt	shovel limit
304	269	100	none	0-100 cm: Fine sandy loam, light brown with gray, oxidation present, no gravels	shovel limit
305	269	100	none	0-30 cm: Brown slightly silty fine sand, no roots, no gravels, friable, boundary is clear; 30-100 cm: Gray medium sand mottled with oxidation, no roots, no gravels, compact	shovel limit
306	269	100	none	0-30 cm: Brown silty sandy loam, no roots, no gravels; 30-100 cm: Gray medium sand mottled with oxidation and gray sands	shovel limit
307	269	100	none	0-30 cm: Brown slightly silty fine sand, no roots, no gravels, friable, clear boundary; 30-100 cm: Gray medium sand mottled with oxidation, no roots, no gravels, compact	shovel limit
308	269	100	none	0-39 cm: Gravelly, brown fine sandy silt, few small to medium rounded to subrounded pebbles, gradual and wavy boundary; 39-100 cm: Dark brownish gray silty fine to medium sand	shovel limit
309	269	100	none	0-39 cm: Gravelly, brown fine sandy silt, few small to medium subrounded to subangular pebbles, gradual and wavy boundary; 39-100 cm: Dark brownish gray silty sand	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
310	269	105	none	0-54 cm: Gravelly, brown fine sandy silt, few very small to small subrounded pebbles, gradual and smooth boundary; 54-105 cm: Dark gray fine to medium silty sand	shovel limit
311	269	100	none	0-30 cm: Brown silty fine sand, no gravels; 30-100 cm: Gray medium sand mottled with oxidation, no roots, no gravels	shovel limit
312	269	100	none	0-37 cm: Gravelly, brown fine sandy silt, few very small to small subrounded to rounded pebbles, gradual and smooth boundary; 37-100 cm: Dark brownish gray silty fine to medium sand	shovel limit
313	269	100	none	0-45 cm: Gravelly brown fine sandy silt, few small to large rounded to subrounded pebbles, gradual and smooth boundary; 45-100 cm: Dark gray silty fine to medium sand	shovel limit
314	269	102	none	0-44 cm: Gravelly, brown fine sandy silt, few very small subrounded to rounded pebbles; 44-102 cm: Dark brownish gray fine to medium silty sand	shovel limit
315	269	103	none	0-41 cm: Gravelly, brown fine sandy silt, few small subrounded to rounded pebbles, gradual and smooth boundary; 41-103 cm: Dark brown gray fine to medium silty sand, black mottling that was compact sandy silt	shovel limit
316	269	100	none	0-100 cm: Silty fine sandy loam, brown, no gravels	shovel limit
317	269	100	none	0-30 cm: Brown slightly sandy silt, no roots, no gravels, friable, clear boundary; 30-100 cm: Gray medium sand mottled with oxidation, compact	shovel limit
318	269	110	none	0-40 cm: Plow zone; 40-60 cm: Mottled silty clay; 60-110 cm: Gray sand	shovel limit
319	269	100	none	0-40 cm: Plow zone; 40-60 cm: Mottled silty clay; 60-100 cm: Gray sand	shovel limit
320	269	110	none	0-30 cm: Plow zone; 30-80 cm: Mottled silty clay; 80-110 cm: Gray sand	shovel limit
321	269	100	none	0-40 cm: Brown slightly sandy silt, no gravels, no roots, friable, clear boundary; 40-100 cm: Gray medium sand; oxidation, no gravels, no roots	shovel limit
322	269	100	none	0-40 cm: Silt loam, brown, no gravels; 40-100 cm: Gray medium sand, oxidation, no gravels, no roots	shovel limit
323	269	100	none	0-30 cm: Plow zone; 30-80 cm: Mottled sandy silt, compact, oxidized; 80-100 cm: Gray sand	shovel limit
324	269	107	none	0-39 cm: Gravelly, brown fine sandy silt, few small to medium subrounded to rounded pebbles, gradual and smooth boundary; 39-107 cm: Dark brown silty fine to medium sand	shovel limit
325	288	75	none	0-30 cm: Brown sandy loam, no gravels; 30-75 cm: Super compact, grayish brown silt, oxidation inclusions	compaction
326	288	90	0-20 cm: plastic fragment	0-40 cm: Brown slightly sandy silt, no gravels, friable, clear boundary; 40-90 cm: Gray silt mottled with oxidation, very compact	compaction
327	288	100	none	0-44 cm: Brown fine clayey silt, compact, clear and smooth boundary, 44-100 cm: Brownish gray fine silty sand, some orange discoloration most likely from oxidation	shovel limit
328	288	100	none	0-35 cm: Gravelly, brown fine clayey silt, very few small angular to subrounded pebbles, gradual and smooth boundary; 35-100 cm: Brownish gray fine silty sand, compact	shovel limit
329	288	100	none	0-40 cm: Plow zone, brown loam; 40-60 cm: Gray mottled sandy silt; 60-95 cm: Mottled sand; 95-100 cm: Orange oxidized layer	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
330	288	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled sandy silt; 50-100 cm: Mottled gray sand	shovel limit
331	288	70	none	0-70 cm: Brown sandy silt loam, no gravels; 70-80 cm: Compact silt, grayish brown, oxidation present; 80-100 cm: Brown fine sandy loam	shovel limit
332	288	100	none	0-30 cm: Plow zone, some road gravels present; 30-80 cm: Mottled silt loam; 80-100 cm: Reddish silt loam	shovel limit
333	288	101	none	0-46 cm: Gravelly, brown clayey silt, few very small to small rounded to subrounded pebbles, clear and smooth boundary; 46-101 cm: Brownish gray fine to medium silty sand	shovel limit
334	288	101	none	0-41 cm: Gravelly brown fine clayey silt, few very small to small rounded to subrounded pebbles, gradual and smooth boundary; 41-100 cm: Light yellowish gray silt, dry	shovel limit
335	288	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled hard packed sandy silt; 50-90 cm: Gray sand; 90-100 cm: Oxidized sand	shovel limit
336	288	110	none	0-60 cm: Plow zone; brown slightly sandy silt, no gravels, no roots, friable, clear boundary; 60-110 cm: Gray medium sand, mottled with oxidation, no gravels, layered with gray silt and brown sand	shovel limit
337	288	100	none	0-30 cm: Plow zone; 30-100 cm: Hard packed silt	shovel limit
338	288	100	none	0-44 cm: Gravelly, brown clayey silt, common small to large subangular to subrounded pebbles, clear and smooth boundary; 44-79 cm: Gravelly dark orangey brown fine sandy silt, many small to large subrounded to subangular pebbles, abrupt and smooth boundary; 79-100 cm: Gravelly light gray fine to medium silty sand	shovel limit
339	288	80	none	0-5 cm: Plow zone, brown silt loam, few rounded to semi rounded gravels; 5-80 cm: compact hard brown and gray silt, 5% poorly sorted gravels	compaction
340	288	30	none	0-30 cm: Hard packed, sub angular gravels	compaction
341	288	59	none	0-22 cm: Gravelly, brown clayey silt, common small to large subrounded to subangular pebbles, clear and smooth boundary; 22-59 cm: Gravelly, light yellowish gray sandy silt, very compact	compaction
342	291	103	none	0-48 cm: Dark brown fine sandy silt, very few fine roots, gradual and smooth boundary; 48-89 cm: Gray fine to medium silty sand, clear and smooth boundary; 89-103 cm: Dark gray fine sandy clay	shovel limit
343	291	100	none	0-35 cm: Brown slightly sandy silt, no gravels, no roots, wet, clear boundary; 35-100 cm: Gray slightly silty fine sand with oxidation, wet	shovel limit
344	291	100	none	0-30 cm: Plow zone; 30-100 cm: Mottled silt, compact	shovel limit
345	288	100	none	0-30 cm: Brown fine sandy silt, wet, roots; 30-100 cm: Compact gray silt and brown sand, no gravels, oxidation inclusions	shovel limit
346	288	100	none	0-19 cm: Dark brown fine sandy silt, clear and smooth boundary, 19-69 cm: Gravelly, light brown fine silt, few small to medium subrounded to angular pebbles, clear and wavy boundary; 69-100 cm: Light gray very fine to fine sand and silt	shovel limit

Table D.1, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
347	288	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled silt; 50-60 cm: Light grayish brown packed silt; 60-100 cm: Mottled sand	shovel limit
348	288	100	none	0-30 cm: Plow zone; 30-50 cm: Mottled brown silt; 50-70 cm: Light grayish brown packed silt; 70-100 cm: Mottled sand	shovel limit
349	288	101	none	0-22 cm: Dark brown fine sandy silt, clear and smooth boundary; 22-79 cm: Brown fine to very fine sandy silt, gradual and smooth boundary; 79-101 cm: Brownish gray fine to medium silty sand	shovel limit
350	288	100	none	0-60 cm: Brown slightly sandy silt, no gravels, no roots, wet, clear boundary, plow zone was from 0-30 cmbs; 60-100 cm: Gray coarse sand, mottled with oxidation, wet	shovel limit
351	288	100	none	0-50 cm: Brown silt loam, no gravels, plow zone; 50-100 cm: Coarse dark grayish brown sand, no gravels	shovel limit
352	288	100	none	0-51 cm: Brown fine sandy silt, gradual and clear boundary; 51-75 cm: Grayish brown fine to medium silty sand, gradual and clear boundary; 75-100 cm: Dark brown medium to coarse sand	shovel limit
353	288	100	none	0-30 cm: Plow zone; 30-60 cm: Mottled silt; 60-80 cm: Light gray oxidized packed silt; 80-100 cm: Mottled and oxidized sandy silt	shovel limit
354	288	100	none	0-30 cm: Plow zone, 30-60 cm: Hard packed brown silt; 60-100 cm: Hard packed mottled sandy silt	shovel limit
355	288	100	none	0-71 cm: Brown fine sandy silt, few fine roots to medium roots, clear and smooth boundary; 71-100 cm: Grayish brown fine to medium silty sand	shovel limit
356	288	100	none	0-40 cm: Plow zone, brown slightly sandy silt, no gravels, no roots, wet, clear boundary; 40-100 cm: Gray slightly silty fine sand, mottled with oxidation, wet	shovel limit
357	288	100	none	0-30 cm: Plow zone, gravel and fill; 30-50 cm: Packed brown silt; 50-100 cm: Hard packed mottled silt	shovel limit
358	291	100	none	0-30 cm: Silt loam, brown, no gravels; 30-100 cm: Grayish brown sandy loam, oxidation present, no gravels	shovel limit

Table D.2. Shovel Test Data, Site 45PI488 Area.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
1	133	110	none	0-110 cm: Sandy clay silt, no gravels	shovel limit
2	133	70	none	0-40 cm: A horizon, brown slightly silt fine sand with oxidation, roots throughout; 40-70 cm: B horizon, brown slightly silty fine sand with oxidation, roots throughout	root
3	133	100	none	0-100 cm: Top 15 cm is gravels, sandy clay silt to bottom	shovel limit
4	133	100	none	0-30 cm: Brown, slightly silty sand, few small to medium pebbles, roots, wavy boundary; 30-70 cm: Gray fine sand, friable, wavy boundary; 70-100 cm: Dark gray medium sand, friable	shovel limit
5	134	100	none	0-100 cm: Very little gravels, silty clay sand to bottom,	shovel limit
6	134	100	none	0-100 cm: Sandy clay, hard packed peds, little gravel	shovel limit
7	134	100	none	0-100 cm: Sandy clay, hard packed peds, little gravel	shovel limit
8	134	100	none	0-100 cm: Silty sand mottled with sandy clay, no gravels, some cobbles, 5%, small roots	shovel limit
9	134	100	30 cm: 1 FMR	0-40 cm: A horizon, brown silty fine sand, dense rootlets throughout; 40-100 cm: Grayish brown fine sand, highly oxidized, dry	shovel limit
10	134	100	none	0-30 cm: Brown slightly silty fine sand, few small pebbles, roots, friable, clear boundary; 30-70 cm: Gray fine sand with red oxidation staining, friable, clear boundary; 70-100 cm: Gray medium sand, friable	shovel limit
11	134	100	0-50 cm : 2 clear glass fragments	0-50 cm: A horizon, fine sandy silt, fine roots; 50-70 cm: Grayish brown fine sand, oxidation present; 70-100 cm: Gray fine to medium sand with oxidation throughout	shovel limit
12	134	100	none	0-100 cm: Sandy loam, few pebbles, few roots	shovel limit
13	134	100	0-20 cm: 1 FMR, glass fragments	0-35: Brown silty fine sand, few small pebbles, roots, 1 glass fragment, friable, clear boundary; 35-50 cm: Gray fine sand with red oxidation staining, friable, clear boundary; 50-100 cm: Gray medium sand, friable	shovel limit
14	134	100	none	0-100 cm: Loose, sandy silt, few roots	shovel limit
15	134	100	none	0-100 cm: Loose, sandy silt, few roots	shovel limit
16	134	100	none	0-35 cm: A horizon, brown slightly sandy silt, fine roots throughout; 35-80 cm: Grayish brown fine sand, oxidation present, trace rootlets present; 80-100 cm: Brown fine to medium sand, oxidation present, moist	shovel limit
17	134	100	none	0-100 cm: Sandy clay loam, few gravels, small roots	shovel limit
18	134	100	none	0-35 cm: Brown slightly silty fine sand, few small pebbles, roots, friable, clear boundary; 35-70 cm: Gray fine sand with red oxidation staining, clear boundary; 70-100 cm: Brownish gray medium sand	shovel limit

Table D.2, continued.

Shovel Test No.	Parcel No.	Depth (cm)	Cultural Materials	Sediments	Reason for Termination
19	134	50	none	0-40 cm: Gravelly, brown fine sandy silt, few small to very small pebbles, clear and smooth boundary; 40-50 cm: Brownish gray fine silty sand with mottling, terminated at utility wires	utility wires

CULTURAL RESOURCES REPORT COVER SHEET

Authors: Rebecca Stevens and Sean Stcherbinine

Title of Report: Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington

Date of Report: October 2017

County(ies): Pierce

Section: 1 Township: 20N Range: 3E
Section: 5-8,16,17,20-22 Township: 20N Range: 4E

Quad: Tacoma, Tacoma N, Poverty Bay Acres: 6.7

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington

By: Rebecca Stevens and Sean Stcherbinine

Principal Investigator: Jennifer Wilson

Submitted to Washington Department of Transportation
Agreement GCB-1426, Task Order Document AT

Short Report DOT17-03
Archaeological and Historical Services
Eastern Washington University

December 2017

Executive Summary

Since cultural resources fieldwork in 2015 for the SR 167 Extension Project – Puyallup to SR 509, "Phase 1" of the project has been funded. Current fieldwork was undertaken in support of NEPA re-evaluation of the project. No cultural resources were identified as a result of the survey/shovel testing of the 6.7 acres in the Phase 1 ROW investigated in 2017. Documentation completed for the NEPA re-evaluation of the SR 167 Extension Project Phase 1 ROW to date is sufficient to support a finding that the 2006 FEIS cultural resources determination is not significantly different than that for the Phase 1 ROW regarding cultural resources.

Acronyms

APE—area of potential effects
Cmbs—centimeters below surface
DAHP—Department of Archaeology and Historic Preservation
FEIS—Final Environmental Impact Statement
FHWA—Federal Highways Administration
NEPA—National Environmental Policy Act
NRHP—National Register of Historic Places
RA—Refined Alignment (2008)
ROD—Record of Decision
ROW—Right-of-way
SR—State Route
ST—shovel test
WHR—Washington Heritage Register
WSDOT—Washington State Department of Transportation

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Archaeological and Historical Services, Eastern Washington University
Cultural Resource Short Report Form

Authors: Rebecca Stevens and Sean Stcherbinine **Date:** October 2017
USGS Quadrangle(s): Tacoma N, Tacoma S, Poverty Bay, Puyallup
Location (Sec., T, R): T20N, R3E, Section 1; T20N, R4E, Sections 5-8, 16, 17, 20-22

PROJECT DATA

Agency/Sponsor: Washington State Department of Transportation

Contract Number (TOD): GCB1426 (AT)

PROJECT DESCRIPTION

Undertaking/Area of Potential Effects: Washington State Department of Transportation (WSDOT) plans to build a new State Route (SR) 167 connection between Tacoma and Puyallup as part of the SR 167 Extension Project—Puyallup to SR 509 new freeway. The purpose of the SR 167 Extension Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 spur, and the Port of Tacoma. The project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor.

The project area of potential effects (APE) has been defined as the proposed right-of-way (ROW) and one tax parcel on either side of the ROW where indirect effects may occur (Figure 1). Potential effects to archaeological sites are primarily anticipated where ground disturbance will occur during project construction. Historic structures may be directly affected by the above described construction activities and may be indirectly affected by noise, vibration, or changes to the visual environment associated with the construction and implemented use of the proposed project. The original alignment for the project as documented in the 2006 Final Environmental Impact Statement (FEIS) was investigated through archaeological survey, built environment survey, and limited archaeological testing in 2000-2004 (Luttrell 2001-revised 2005, 2002a, 2002b, 2004; Luttrell et al. 2004). In 2015, additional field survey and shovel testing for archaeological resources was undertaken within a "Refined Alignment" (RA) ROW developed in 2008 (Yamamoto et al. 2015). At that time, portions of the RA ROW that were not part of the FEIS alignment ROW were investigated. Portions of the project APE outside of the direct impact archaeological survey area were surveyed in 2015 for those built environment buildings/structures that were not addressed during investigations supporting the EIS phase, or that had reached the 45

year threshold in the interim. The cultural resources investigations for this project will assist the Federal Highways Administration (FHWA) and WSDOT in compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act.

Not all previously uninvestigated areas of the RA ROW could be surveyed for cultural resources in 2015 due to lack of right-of-entry for some parcels and, in portions of other parcels, standing water, planted crops, etc. (Yamamoto et al. 2015). The 2015 report identified those pedestrian survey/shovel test areas that could not be accessed (Yamamoto et al. 2015:Table 2).

Since the 2015 fieldwork, "Phase 1" of the SR 167 Extension Project has been funded (see Figure 1). The Phase 1 improvements will complete the SR 167 freeway by building approximately four miles of a new, four-lane facility from its current terminus in Puyallup at SR 161, through the Puyallup River valley and connecting to I-5 near the 70th Avenue undercrossing. The project also includes a new, approximately two-mile-long highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Extension Project is planned (based upon Legislative intent) to be a tolled facility.

The current investigation involves survey, including shovel testing, of specified portions of the Phase 1 ROW that could not be surveyed for cultural resources in 2015. The Phase 1 ROW is almost identical to the 2008 RA ROW. Not all areas identified in 2015 for survey were included in the scope of work for survey in 2017. This update to the 2015 investigation has been prepared to support WSDOT's NEPA re-evaluation process to document impacts from Phase 1 implementation.

Cultural Resource Task(s): For the 2017 Phase 1 ROW investigation, Archaeological and Historical Services (AHS), Eastern Washington University, completed the following tasks: 1) survey of 6.7 acres and excavation of a total of 36 shovel tests in portions of Phase 1 ROW parcels not previously surveyed for cultural resources; and, 2) preparation of this report of findings.

LOCATION

Project/locational information: The project is located in Pierce County, between SR 509 and SR 167 (see Figure 1).

Landowner(s): WSDOT and private

ENVIRONMENTAL BACKGROUND

The environmental background of the project area has been documented in multiple previous reports (Luttrell 2001-revised 2005, 2002a, 2002b, 2004; Luttrell et al. 2004; Yamamoto et al. 2015) and is summarized below. The project APE is adjacent to Puget Sound, in the Puget Lowland within the lower Puyallup River valley. Major streams crossing or adjacent to the project APE are the Puyallup River, Hylebos Creek, and Wapato Creek. During the late Pleistocene, the Puget lobe of the Cordilleran ice sheet covered the Puget Lowland. The most recent episode of extensive ice cover was during the Vashon Stade of late Pleistocene Fraser Glaciation (Thorson 1980:303).

Pierce County has a marine west coast climate. Summers are generally cool and dry, while winters are moist and comparatively mild. The Cascade Range to the east protects the area from continental air masses that intensify the cold winters and hot summers characteristic of central Washington. Project APE soils are of the Puyallup-Sultan association. This soils group includes the nearly level floodplains in the vicinity of Puyallup and Fife. These soils formed in alluvium and tend to be well drained or moderately well drained (Zulauf 1979).

Farm, residential, and industrial uses dominate the Puyallup-Sultan soil association and, consequently, vegetation patterns are greatly altered from those of the pre-settlement period. Formerly, the project APE vicinity was thickly vegetated with a mixed coniferous and deciduous overstory and an understory of young trees, shrubs, and vines. The project APE lies within the Puget Sound area of the *Tsuga heterophylla*, or western hemlock, vegetation zone (Franklin and Dyrness 1973:44) but, except along waterways, natural vegetation has been replaced by cultivated truck gardens, pastures, and urban development. Cultivated crops such as lettuce, celery, cabbage, pumpkins, corn, berries, bulbs, and flowers are some of the more important local farm products. Those and ornamental species in urban areas comprise the general vegetation pattern present in the project area.

ETHNOGRAPHIC/HISTORIC BACKGROUND

The project area ethnographic/historic background documented in previous reports (Luttrell 2001-revised 2005; Yamamoto et al. 2015) is summarized below. The Southern Lushootseed-speaking Puyallup are directly associated with the Puyallup River area. Neighboring groups included the closely related Nisqually, as well as the Skokomish and the various peoples collectively known as the Muckleshoot Indians. All aboriginal groups in the Southern Puget Sound adhered to a winter village pattern wherein sedentary populations coalesced at specific sites during winter months. A village's population was normally greatest during the winter season. Smith (1940:8-10) identifies a number of Puyallup-Nisqually villages, including four potentially located in or near the project area:

4. kalkalaqu - At the mouth of Wappato [Wapato] Creek, just above the grasslands.

5. shaxlabc - Located on Hylebos Waterway. Derived from haxl', the name of Hylebos Waterway, in which silver salmon were plentiful.

6. tsaqwe′qwabc - Located where Clarks Creek emptied into the Puyallup River. Derived from saqwéqu, the name of Clarks Creek. In addition to contacts up and down the Puyallup River this village had strong connections with that of Clover Creek (19).

7. sq'wa′dabc - Located above the Wappato Creek village, where a creek entered Wappato Creek. Derived from q'wad, the name of the creek, Simmons Creek (?).

Some of Smith's (1940) information was drawn from ca. 1920 native informant interviews by Thomas T. Waterman. Of the many place names Waterman recorded in Puyallup territory, three are located in the central part of the project area: the flats between Hylebos Creek and Wapato Creek whose aboriginal name means "place around which the water flows"; a place where Wapato Creek approaches a swamp extending to Hylebos Creek, meaning "plowing through with a canoe," due to the fact that a canoe could be shoved from the creek into the swamp to hunt beaver; and, Simon's Creek flowing from Surprise Lake to Wapato Creek the name of which means "waterfall" (Waterman 1920:124).

A succession of events bridge the aboriginal and post-contact settlement periods in Puget Sound, including initial Euro-American "discovery," fur trader activity, and the formation of nearby Indian reservations. Maritime explorations of the Washington coast were undertaken after 1770 by Spanish, English, and American interests to evaluate the colonization and economic exploitation potential. However, Hudson's Bay Company establishment of Fort Nisqually near present-day DuPont in 1833 marked the first significant non-native settlement in proximity to the SR 167 project APE. Widespread White settlement of the Puyallup River valley did not occur until after 1860 when the region was more generally known and native groups had been encouraged to move to federal reserves.

In 1852, Nicholas Delin located a Donation Land Claim (DLC) at the head of Commencement Bay, an area now included within the Tacoma city limits (Hawthorne 1893:365-367). A dozen or so DLCs were subsequently taken up near the south end of the project area on land near the Puyallup River or on land now within the Puyallup city limits. The closest DLCs to the proposed highway improvements include that of John Carson. He is perhaps best known today for his association with a large chestnut tree believed to be the sole remaining feature of his claim. The Carson Chestnut Tree is located at the east end of the project ROW (see Figure 1).

Other than Tacoma and Puyallup, the only other significant historic city with direct bearing on the SR 167 project area is the smaller town of Fife. This former rural community is one of many small agricultural centers that developed in the Puyallup River valley. Fife was reportedly founded in

1883, although it did not gain a post office until May 12, 1900 (Heritage League of Pierce County 1990:68; Landis 1969:W:29). Fife evolved into the hub of an agricultural district of dairies, chicken ranches, bulb and berry operations, and vegetable truck farms. Construction of Highway 99 (SR 99) divided the town in half, but also increased its accessibility from Tacoma and Seattle. By 1941, Fife also served as a bedroom community for manufacturing workers in Tacoma. It was a place where one could afford a home and small acreage for "truck gardening" (*The Tacoma News Tribune* 1941:9). Nearby Puyallup is the largest community in the Puyallup River valley. At an earlier time and on a much larger scale than Fife, Puyallup grew from tiny Franklin into a large urban center surrounded by productive farms.

Contemporary development is drastically changing project area land uses. Such development includes commercial, industrial, and warehouse construction on former farm and residential land. The Fife business district has expanded; few farms are now located within its vicinity. Current agricultural use within the project area is taking place on WSDOT-owned parcels leased to farmers. Level land once favored for its rich soil is now desired for large manufacturing and product distribution complexes accessible from nearby highways and by Port of Tacoma shippers. These evolutionary land use changes are occurring at an unprecedented pace.

PREVIOUSLY RECORDED CULTURAL RESOURCES

Ten previously recorded cultural resources determined eligible to either the NRHP or the Washington Heritage Register of Historic Places (WHR) have been documented in the project APE (Table 1). Extant residences are identified on maps in this report by their 2015 field numbers (Yamamoto et al. 2015). The locations of extant resources are identified on Figure 1.

Table 1. Eligible Properties in the SR 167 Extension Project APE.

Property	Eligibility	Comment	In Phase 1 ROW
Site 45PI488	NRHP		yes
Carson Chestnut Tree	WHR		yes
6803 20th Street E	NRHP	demolished	n/a
7001 20th Street E	NRHP	demolished	n/a
7717 Valley Avenue E	NRHP	demolished	n/a
6020 8th Street E	NRHP	Field No. 11	yes
4403 Freeman Road E	NRHP	Field No. 22	yes
6007 Milwaukee Avenue E	NRHP	Field No. 37	yes
620 Milwaukee Avenue E	NRHP	Field No. 40	no
860 64th Avenue	NRHP	Field No. 42	no

Prehistoric site 45PI488 was determined eligible for listing in the NRHP in 2003. The FHWA determined, and the Washington Department of Archaeology and Historic Preservation (DAHP) concurred, that the SR 167 project will not have an adverse effect on the site if it is spanned with a bridge constructed outside the known site boundaries and if cultural resources monitoring in the vicinity is implemented during construction activities (FHWA 2006:H-10, 2007:59). The WSDOT's obligations remain unchanged and the Phase 1 design will avoid impacting the prehistoric site pursuant to DAHP's concurrence and FHWA Record of Decision (ROD) commitment (FHWA 2007).

The SR 167 Extension Project implemented Carson Chestnut Tree protection in all design options in the SR 161/SR 167 interchange vicinity (FHWA 2007:24). "No effect on the Carson Chestnut Tree is expected because FHWA and WSDOT have committed to avoiding the tree and avoiding construction activities that might damage the tree" (FHWA 2007:25). The Phase 1 design will avoid impacting the Carson Chestnut Tree and WSDOT's obligations pursuant to the FHWA ROD commitment remain unchanged.

Three NRHP-eligible Fife residences within the Phase 1 ROW identified in the 2006 FEIS (6803 20th Street E, 7001 20th Street E, and 7717 Valley Avenue E) each were documented through the DAHP Level II process (involving historical research, maps, drawings [as appropriate], and archival photography) and subsequently demolished by WSDOT. The remaining five residences listed in Table 1 were the only properties of the 65 recorded in 2015 (Yamamoto et al. 2015) in the project APE determined eligible for listing in the NRHP.

Two parcels in the project APE, one (p236) partially within the Phase 1 ROW (see Figure 1) and one immediately adjacent (p235), are reported by the Puyallup Tribe to contain tribal burials. The remote sensing study conducted at this location in 2004 did not confirm or rule out burials at this location: "While the prospect of identifying burials in the Wapato Creek channel is not necessarily a 'needle in a haystack' scenario, the outcome of the data interpretation should be tempered with the understanding that any, all or none of the anomalies presented here could be human burials" (Lenz and McFarland 2004:22). The location will be avoided and the Puyallup Tribe notified should any ground disturbing activity be planned in that vicinity (FHWA 2007:24).

CULTURAL RESOURCE SURVEY RESEARCH DESIGN

Objectives: The objective of this study is to assist WSDOT in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, by the location and preliminary characterization of both previously and as yet unidentified cultural resources within the area of potential effects.

Area surveyed: Portions of several parcels previously unsurveyed for cultural resources within the Phase 1 ROW were surveyed and shovel tested. A total of 6.7 acres were surveyed.

Methods: Fieldwork was undertaken by AHS archaeologists Sean Stcherbinine and Jeff Johnson on September 9-12, 2017. Transects no wider than 30 meters were walked over 100 percent of the areas identified for survey to determine the presence/absence of previously unrecorded cultural resources.

Shovel tests were excavated in those areas identified in the scope of work. Each test measured approximately 30-40 centimeters in diameter. Sediments were screened through ¼-inch-mesh hardware cloth. Tests were generally excavated to depths of up to 100 centimeters below surface (cmbs). A hand auger was used in the bottom of some shovel tests once the limit of hand excavation with a shovel (ca. 100 cmbs) was reached. All shovel test locations were mapped using a hand held GPS unit. Each test was documented on standard AHS forms and backfilled immediately. All records and photographs generated during fieldwork are on file at the AHS Cheney office.

RESULTS

The 2017 NEPA Re-Evaluation of the SR 167 Extension Project – Puyallup to SR 509 cultural resources survey completed investigations in five parcels within the Phase 1 ROW (Table 2). Figures 2 through 5 are aerial maps identifying the project APE, the Phase 1 ROW, and the 2017 survey/shovel test areas. (Some areas required both pedestrian survey and shovel testing, others were surveyed in 2015 and required only shovel testing.) Figure 6 provides shovel test location detail for parcels 130, 189, 190, and 211; a single shovel test (ST 36) was excavated in parcel 62 (see Figure 3).

Table 2. Shovel Tests Excavated and Acreage Surveyed, 2017, by Parcel Number.

WSDOT Parcel No.	Shovel Tests Excavated (n=)	Acres Surveyed	Comments
62	1		residential yard (see Figure 3)
130	5	1.1	shop yard and equipment staging area (see Figures 3 and 6)
189	18	3.6	agricultural field (see Figures 3 and 6)
190	6	2	agricultural field, shovel test line offset to avoid lettuce crop (see Figures 3 and 6)
211	6		agricultural field, recently plowed (see Figures 3 and 6)

No cultural resources were identified during pedestrian survey of 6.7 acres in three parcels or in any of the 36 shovel tests excavated in the five parcels revisited. No buildings/structures in the 2017 6.7-acre project area crossed the 45-year-old threshold since the 2015 investigations and no additional structures were recorded in 2017. Fieldwork is described by parcel below. Shovel test data is presented in Appendix A.

Parcel 62

Parcel 62 is a residential property that was surveyed in 2015. A single shovel test (ST 36) was excavated there in 2017 to complete the parcel investigation (Figure 7). No cultural materials were observed in the shovel test sediments. Sediments excavated from ST 36 were homogeneous—light brown Holocene alluvium; the test was excavated to 100 cmbs (see Appendix A).

Parcel 130

To complete investigations in p130, 1.1 acres was surveyed and five shovel tests were excavated (STs 25-29) (Figure 8). The area surveyed is used as a scrap yard and staging area. No cultural materials were observed in excavated sediments. Sediments were Holocene alluvium or fill material (see Appendix A).

Parcels 189, 190, and 211

A total of 5.6 acres was surveyed in contiguous parcels 189 and 190 and 30 shovel tests were excavated in those parcels and the adjoining p211 (see Figure 6). Pedestrian survey of p211 was completed in 2015 (Yamamoto et al. 2015); in 2017 six shovel tests were excavated in p211. All three parcels are currently agricultural. No cultural materials were identified during survey or shovel testing in the three parcels.

Volunteer alfalfa and weeds covered most of the eastern half of p189 at the time of the 2017 survey. Sediments excavated were Holocene alluvium, silts and sands (see Appendix A). Eighteen of the 25 planned shovel tests in p189 were excavated. The tests in the northeast corner of p189 were not excavated; shovel testing was halted at the advice of environmental contractors (non-WSDOT and not associated with the SR 167 Extension Project) working on an adjacent parcel during fieldwork (Figure 9). The lack of cultural material in the other shovel tests excavated in p189 and adjacent parcels in 2015 (Yamamoto et al. 2015) and during the 2017 fieldwork suggests that the 2015 and 2017 shovel testing is a sufficient sample for p189.

The portion of p190 to be shovel tested was planted in lettuce (Figure 10). The line of six shovel tests (ST 30 through ST 35) was offset to avoid lettuce plants (see Figure 6). Parcel 190 shovel tests were excavated to 100 cmbs with the exceptions of ST 30 which was excavated to 200 cmbs and ST 32 which was terminated at 65-75 cmbs on a plastic pipe (Figure 11). Parcel 211, an empty field, had recently been plowed (Figure 12). Shovel tests 19 through 23 on p211 were terminated between 55 and 90 cmbs due to a high water table resulting in collapsing shovel test walls. One shovel test (ST 24), excavated to 105 cmbs, was terminated when the hand auger could not retain the loose sands. Sediments excavated in both p190 and p211 were silts, in some places overlying sands (see Appendix A).

Summary—2017 Fieldwork

After the 2015 cultural resources survey, parcels and portions of parcels that could not be accessed due to lack of right-of-entry, locked fences, etc., were identified and recommended for survey prior to ground disturbance (Yamamoto et al. 2015:Table 2). The survey/shovel testing areas selected by WSDOT for survey in 2017 were identified in the 2015 report. No cultural resources were identified in the five parcels (see Table 2) investigated in 2017. Table 3 identifies portions of other parcels within the Phase 1 ROW recommended for survey/shovel testing at the end of 2015 fieldwork that were not included in the 2017 SOW for cultural resources investigation.

Table 3. Phase 1 ROW Parcels Cultural Resources Completion Recommendations[a].

Parcel No.	Fieldwork To Complete		Comments	Figure(s)
	STs (n=)	Survey (acres)		
109	1		no structures, open area; no permission to shovel test in 2015	3
110	2		residential building, landscaped; no permission to shovel test in 2015	3
116	4	0.8	densely overgrown, unable to access 2015 project area in SW corner	3
127	1	0.2	residential backyard, chain link fence around perimeter, no access during 2015 survey	3
276	11		agricultural field; no permission to shovel test in 2015	4
743	1		small parcel south of SR 99; across highway from site 45PI488; shovel test to see if subsurface site deposits present across highway	3&6
Totals	**20**	**1.0**		

[a] adapted from Yamamoto et al. (2015:Table 2)

MANAGEMENT SUMMARY

No cultural resources were identified as a result of the survey/shovel testing of the 6.7 acres in the Phase 1 ROW investigated in 2017. The six extant NRHP-eligible historic properties identified in the SR 167 Extension Project APE during previous cultural resources investigations (Luttrell 2001-revised 2005, 2002a, 2002b, 2004; Luttrell et al. 2004; Yamamoto et al. 2015) are listed in Table 4; of the six, four are within the Phase 1 ROW.

Table 4. NRHP-Eligible Resources within the Project APE.

NRHP Eligible Resource	Field No.	Figures	Within Phase I ROW
Site 45PI488	-	1 & 3	yes
6020 8th Street E	11	1 & 3	yes
4403 Freeman Road E	22	1 & 4	yes
6007 Milwaukee Avenue E	37	1 & 5	yes
6020 Milwaukee Avenue E	40	1 & 5	no
860 64th Avenue	42	1 & 3	no

Site 45PI488 is the only prehistoric resource in the Phase 1 ROW determined eligible for listing in the NRHP. The site will be avoided and Phase 1 design will avoid impacts to the resource (FHWA 2006:H-10, 2007:59). If planned Phase 1 ROW construction activities include impacts to any of the three residences within the Phase 1 ROW listed in Table 4, Level II documentation may be appropriate mitigation.

Other Resources within the Phase 1 ROW

The Carson Chestnut Tree, east of SR 161 within the Phase 1 ROW (see Figures 1 and 5), is eligible for listing in the WHR. The Phase 1 design will avoid impacting this resource and WSDOT's commitment to protection of the tree is unchanged (FHWA 2007:25). The potential burial location in p236 (see Figures 1 and 4), partially within the Phase 1 ROW, will be avoided and the Puyallup Tribe notified should any ground disturbing activity be planned in the vicinity (FHWA 2007:24).

Recommendation

The WSDOT is committed to cultural resources survey of all properties in the project APE per the Memorandum of Agreement executed in 2006 and amended in 2009 and 2013. No cultural resources were identified during the survey and shovel testing in five parcels in the Phase 1 ROW in 2017. It is unlikely that completing the remaining small amount of recommended cultural resources fieldwork in the Phase 1 ROW (one acre of survey and 20 shovel tests; see Table 3) would result in changes to WSDOT's determination supporting the NEPA Re-evaluation. It is recommended that documentation completed for the NEPA re-evaluation of the SR 167 Extension Project Phase 1 ROW to date is sufficient to support a finding that the 2006 FEIS cultural resources determination is not significantly different than that for the current Phase 1 ROW.

SOURCES CONSULTED

Federal Highway Administration (FHWA)

2006 *SR 167 - Tacoma to Edgewood - Environmental Impact Statement.* Tier II FEIS. Electronic document, http://www.wsdot.wa.gov/Projects/SR167/completion/documents.htm, accessed September 2017.

2007 *Record of Decision for State Route 167 Extension Project Puyallup to State Route 509.* Electronic document, http://www.wsdot.wa.gov/NR/rdonlyres/50CBFC8E-B423-4C84-9F9F-C77277FAD737/0/SR167_TierIIRecordofDecision_Oct2007.pdf, accessed September 2017.

Franklin, Jerry F., and C.T. Dryness

1973 *Natural Vegetation of Oregon and Washington*. U.S. Forest Service General Technical Report PAW-8, Portland.

Hawthorne, Julian, editor
1893 *History of Washington; The Evergreen State from Early Dawn to Daylight*, Volume 2. American Historical Publishing Company, New York.

Heritage League of Pierce County
1990 *A History of Pierce County, Washington*. Heritage League of Pierce County, Tacoma.

Landis, Robert L.
1969 *Post Offices of Oregon, Washington and Idaho*. Patrick Press, Portland.

Lenz, Brett R., and Douglas McFarland
2004 A Geophysical Analysis of the SR 167 Valley Interchange Project, Fife, Washington. Appendix A in *Cultural Resources Investigations for Washington State Department of Transportation's SR 167: Puyallup to SR 509 Valley Interchange Project, Pierce County, Washington*. Short Report DOT04-16. Archaeological and Historical Services, Eastern Washington University, Cheney.

Luttrell, Charles T.
2001 *Cultural Resources Investigations for the Washington State Department of Transportation's SR 167: Puyallup to SR 509 Project, Pierce County, Washington.* Short Report DOT01-14. Archaeological and Historical Services, Eastern Washington University, Cheney. Revised 2005. (Tier II FEIS alignment)

2002a *SR 167 Tier II EIS (OL3432): Hylebos Creek Relocation Plan*. Letter Report DOT02-07. Archaeological and Historical Services, Eastern Washington University, Cheney. (Appendix F in Luttrell 2001, revised 2005)

2002b *Additional Cultural Resources Investigations for the Washington State Department of Transportation's SR 167: Puyallup to SR 509 Project, Pierce County, Washington.* Short Report DOT02-27. Archaeological and Historical Services, Eastern Washington University, Cheney. Revised 2004. (Hylebos riparian corridor; Appendix G in Luttrell 2001, revised 2005)

2004 *Cultural Resources Investigations for Washington State Department of Transportation's SR 167: Puyallup to SR 509 Valley Interchange Project, Pierce County, Washington*. Short Report DOT04-16. Archaeological and Historical Services, Eastern Washington University, Cheney. (Remote sensing at P235 and P236)

Luttrell, Charles T., Stephen Emerson, and Ryan Ives
2004 *Cultural Resources Investigations for the Washington State Department of Transportation's SR 167: Puyallup to SR 509, Task Group 2 Project, Pierce County, Washington*. Short Report DOT04-08. Archaeological and Historical Services, Eastern Washington University, Cheney. (Wetland mitigation parcel & two park & ride locations, Appendix I in Luttrell 2001, revised 2005)

Smith, Marian W.
1940 *The Puyallup-Nisqually*. Columbia University Press, New York.

The Tacoma News Tribune
1929 "Fife-Gardenville: A Community of Golden Opportunity." October 30, 1929:21:1.

Thorson, Robert M.
1980 Ice-Sheet Glaciation of the Puget Lowland, Washington, During the Vashon Stade (Late Pleistocene). *Quaternary Research* 13(3):303-321.

Waterman, Thomas T.
1920 [Puget Sound Geography]. Manuscript (Ms.) 1864, Smithsonian Office of Anthropology, Bureau of American Ethnology Manuscript Collection. Microfilm on file, Suzzallo Library, University of Washington, Seattle.

Yamamoto, Christopher, Stephen Emerson, and Rebecca Stevens
2015 *Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project–Puyallup to SR 509, Pierce County, Washington*. Short Report DOT15-04. Archaeological and Historical Services, Eastern Washington University, Cheney. (Portions of the project "Refined Alignment" (2008) not investigated during the original FEIS alignment survey)

Zulauf, Allen S.
1979 *Soil Survey of Pierce County Area, Washington*. U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station.

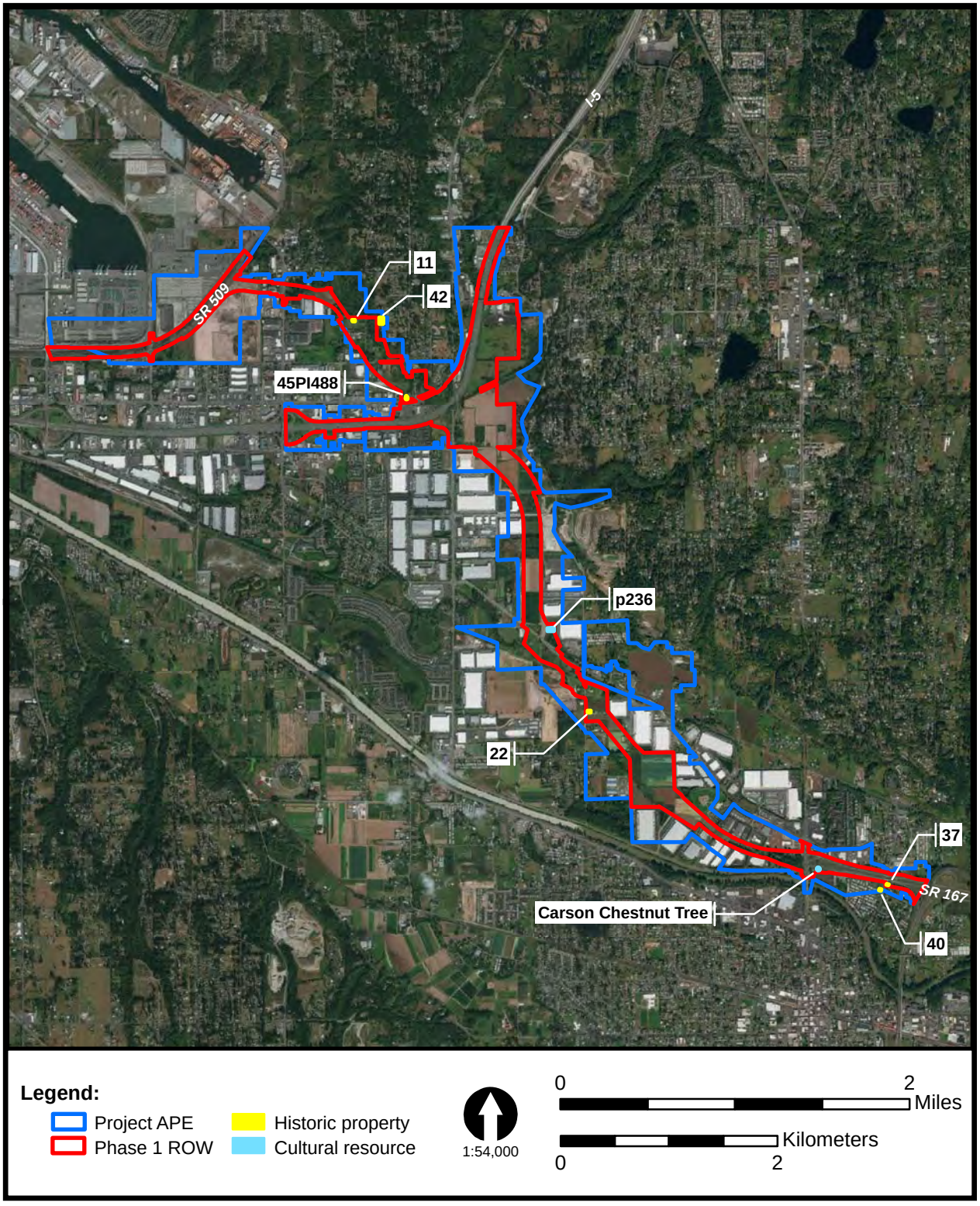


Figure 1. *Aerial photograph showing the SR 167 Extension Project APE, the Phase 1 ROW, and resources mentioned in the text. Historic properties (those determined eligible for listing in the NRHP) are identified in yellow, other resources mentioned in the text are identified in blue. The NRHP-eligible residences are identified by two digit field numbers and p236 identifies WSDOT parcel number 236.*

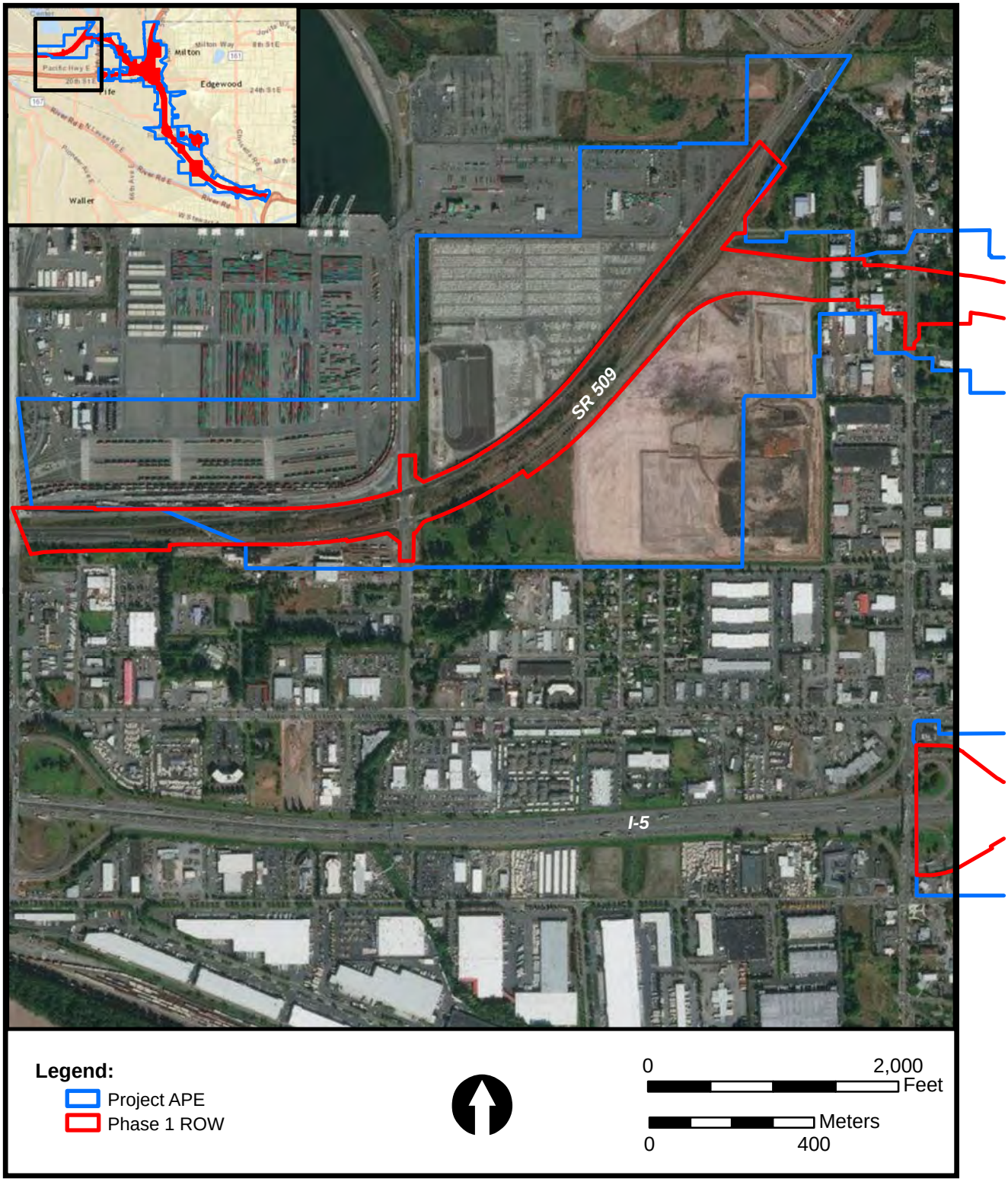


Figure 2. *Aerial map showing the northwest portion of the SR 167 Extension Project area.*

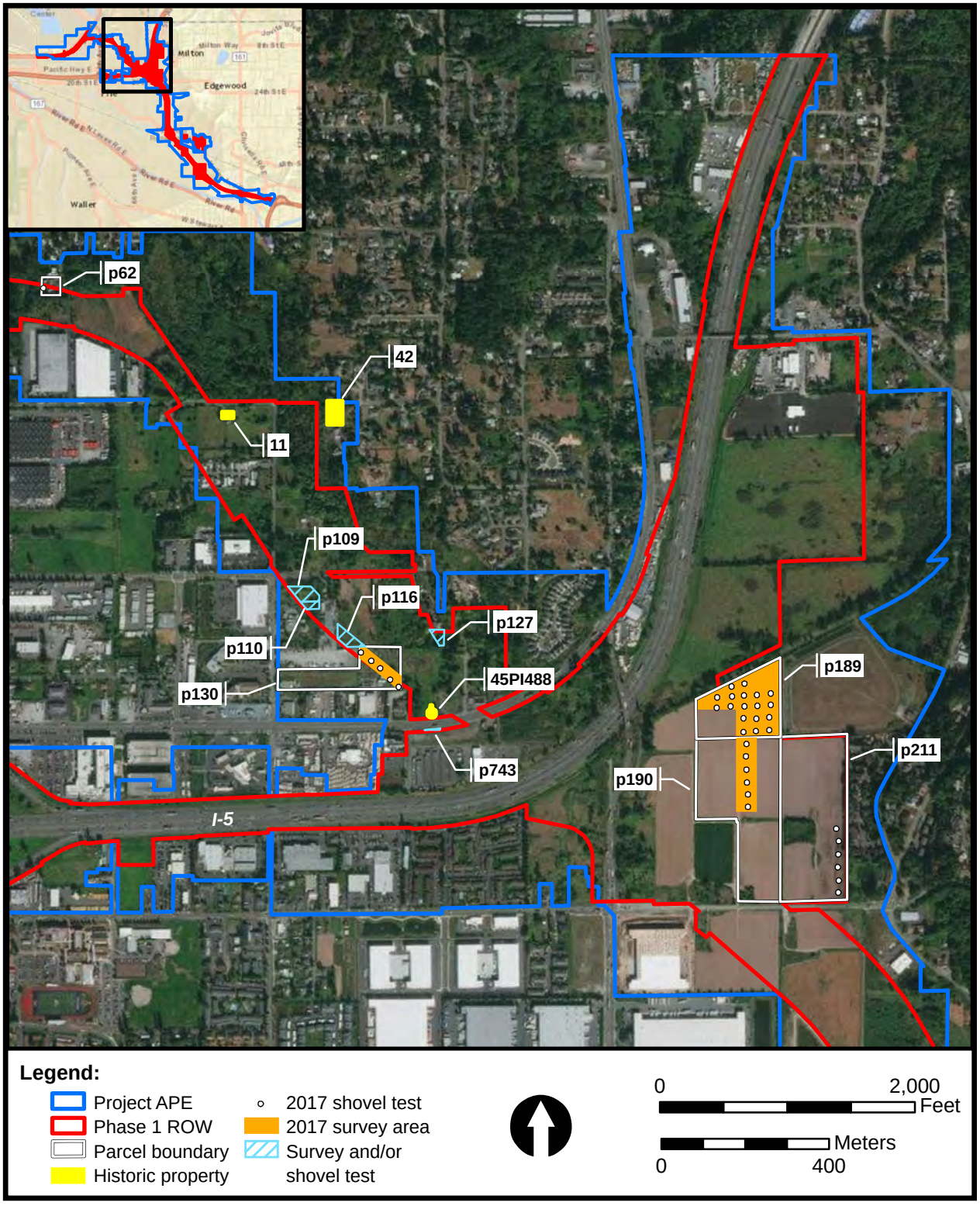


Figure 3. *Aerial map showing the northeast portion of the SR 167 Extension Project area. Historic properties (those determined eligible for listing in the NRHP) are identified in yellow. The NRHP-eligible residences are identified by two digit field numbers and 'p' numbers are WSDOT parcel numbers.*

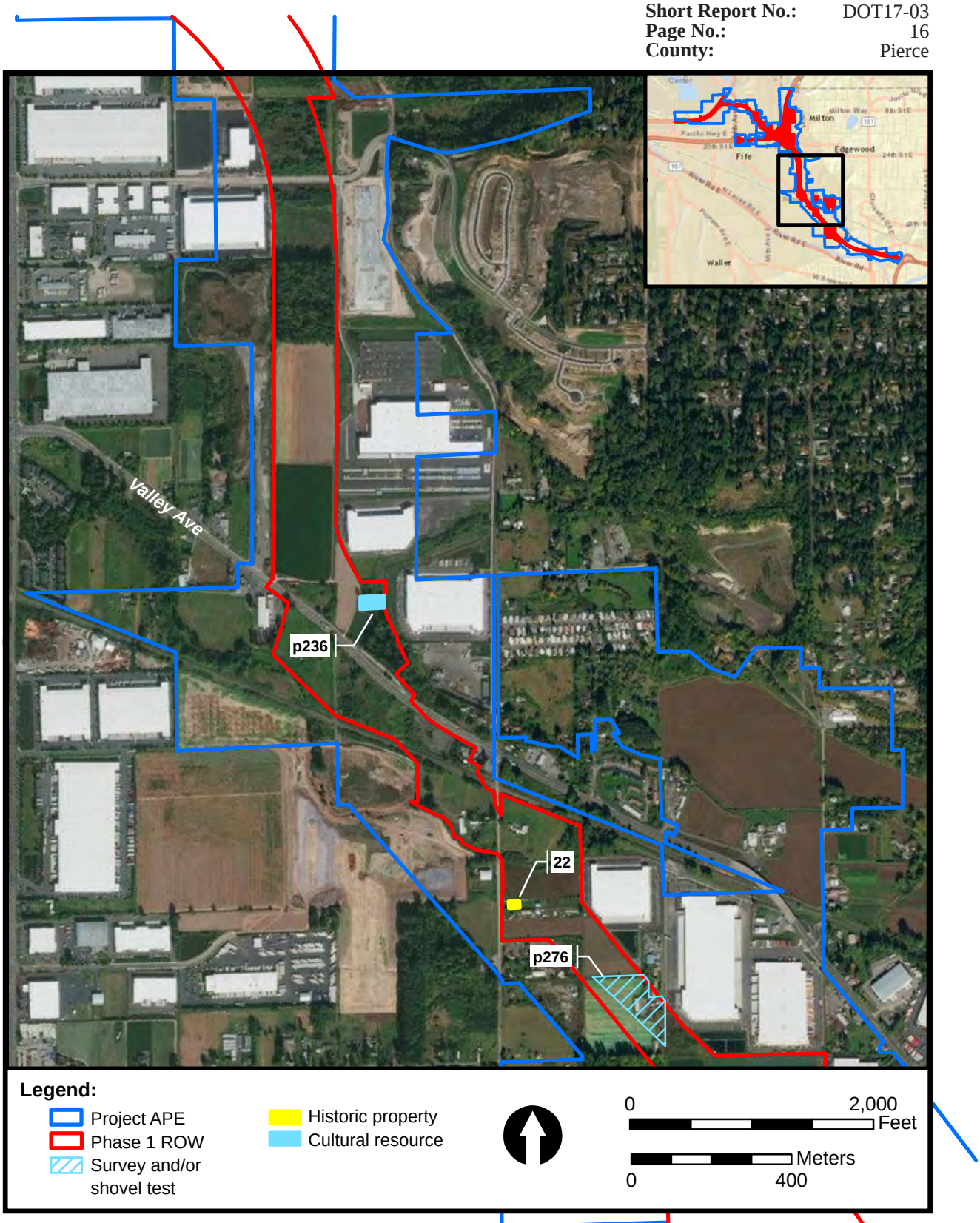


Figure 4. *Aerial map showing the central portion of the SR 167 Extension Project area. Historic properties (those determined eligible for listing in the NRHP) are identified in yellow, other resources mentioned in the text are identified in blue. The NRHP-eligible residences are identified by two digit field numbers and 'p' numbers are WSDOT parcel numbers.*

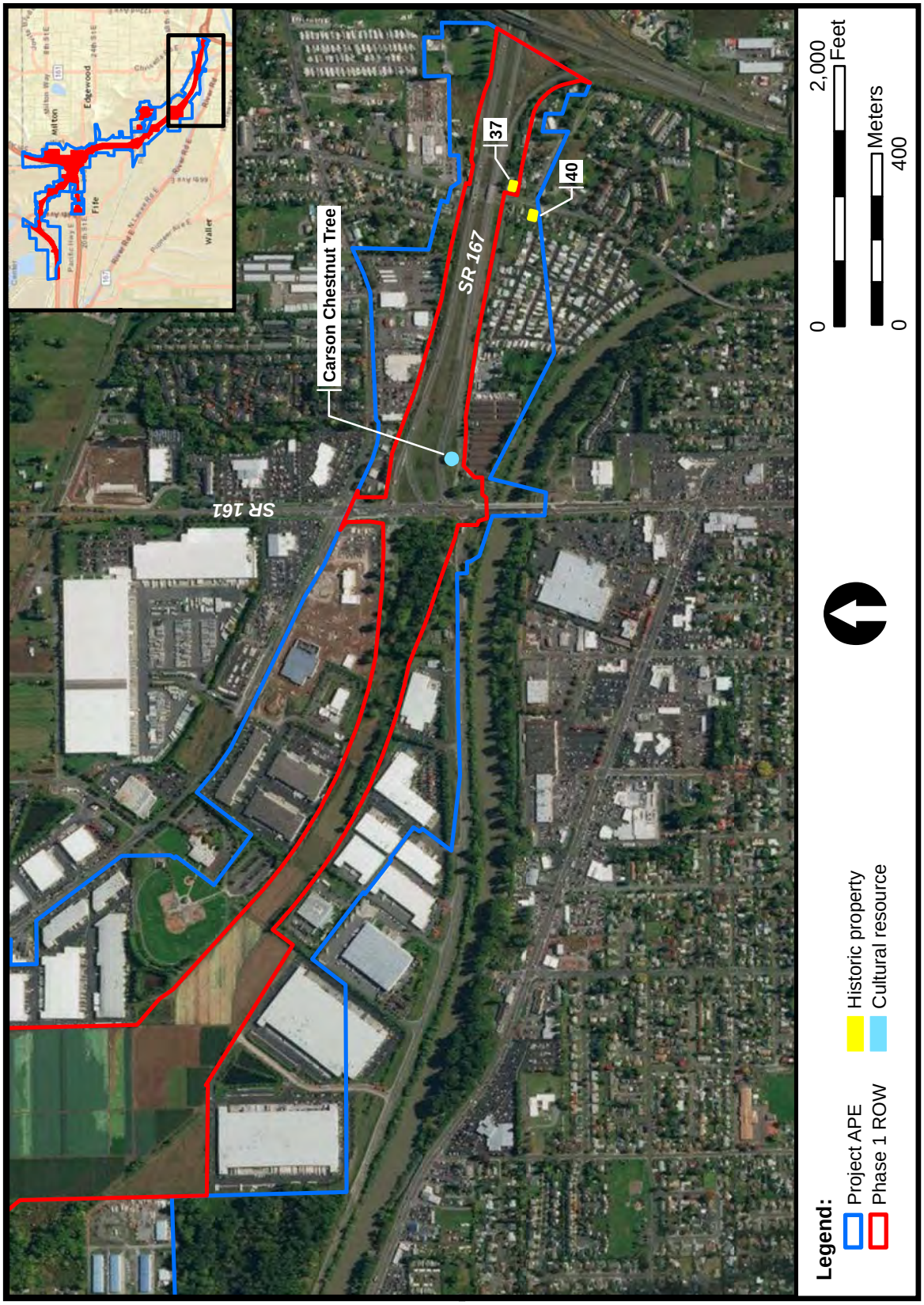


Figure 5. *Aerial map showing the southern portion of the SR 167 Extension Project area. Historic properties (those determined eligible for listing in the NRHP) are identified in yellow, other resources mentioned in the text are identified in blue.*

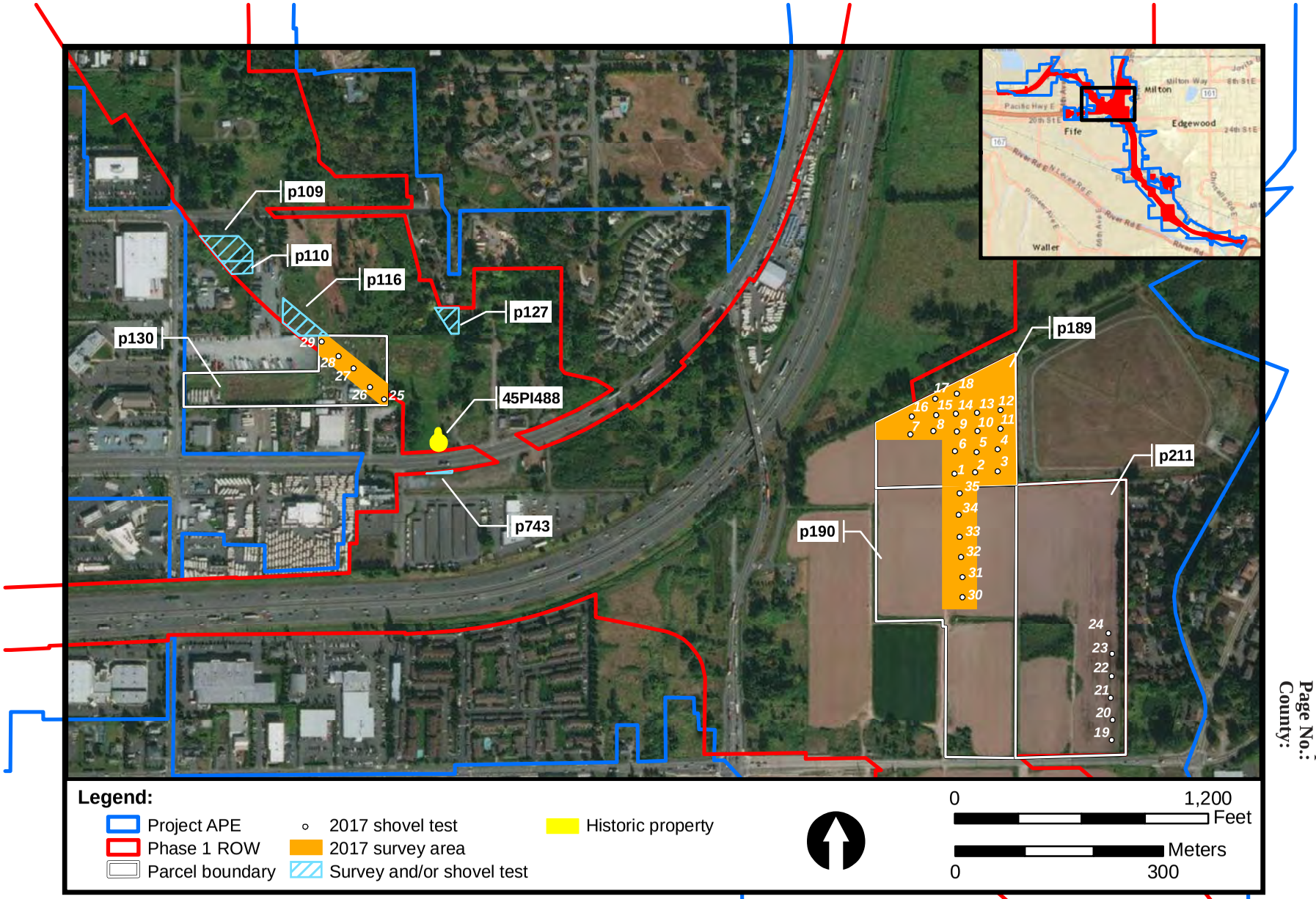


Figure 6. *Aerial map detail identifying surveyed areas and shovel test locations in parcels 130, 189, 190, and 211.*



Figure 7. *Parcel 62 overview, view to the west. Archaeologist is standing in the approximate location of the shovel test excavated on this parcel (ST 36).*



Figure 8. *View to the northwest of scrap yard on parcel 130. Archaeologist is excavating ST 27.*



Figure 9. *Overview of the northeast corner of parcel 189, view to the east. This is the area that was not shovel tested.*



Figure 10. *View to the north along the shovel test line in parcel 190. The shovel tests were offset to avoid the lettuce crop.*



Figure 11. *Shovel test 32 in parcel 190 showing the 5-in-diameter plastic drain pipe at 100 cmbs. The bar scale is marked in 10 centimeter increments.*



Figure 12. *Overview of recently plowed parcel 211, view to the south. Shovel tests 19 through 24 were excavated in this parcel.*

Appendix A

Shovel Test/Auger Results, by Test Number

Table A.1. Shovel/Auger Test Results, by Test Number.

Test No.	Parcel No.	Depth (cmbs)	Sediments	Interpretation	Comments	Reason for Termination
1	189	0-110	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		110-200	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
2	189	0-95	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		95-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
3	189	0-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth
4	189	0-80	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		80-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
5	189	0-80	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		80-100	red to dark brown fine sands	Holocene alluvium	wet soil, no gravels	physical limitations due to depth
6	189	0-95	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		95-104	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
7	189	0-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth
8	189	0-95	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		95-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
9	189	0-95	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		95-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
10	189	0-95	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		95-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
11	189	0-90	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		90-100	grayish brown fine sands	Holocene alluvium	no gravels	physical limitations due to depth
12	189	0-80	dark brown silt with red/oxidized mottling	Holocene alluvium	heavily disturbed 0-90, no gravels	
		80-90	gray fine sands	Holocene alluvium	very wet soil, no gravels	physical limitations due to depth
13	189	0-90	dark brown silt with red/oxidized mottling	Holocene alluvium	partially disturbed 0-50, no gravels	
		90-100	gray silt loam	Holocene alluvium	very wet soil, no gravels	physical limitations due to depth
14	189	0-50	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		50-80	dark brown silt with red/oxidized mottling	Holocene alluvium	dry soil, no gravels	
		80-100	gray fine sands	Holocene alluvium	no gravels	physical limitations due to depth
15	189	0-50	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		50-100	dark brown to gley sands	Holocene alluvium	no gravels	physical limitations due to depth
16	189	0-90	dark brown silt with red/oxidized mottling	Holocene alluvium	woody debris throughout, no gravels	
		90-100	gray fine sands	Holocene alluvium	no gravels	physical limitations due to depth
17	189	0-50	dark brown silt loam	Holocene alluvium	no gravels, woody debris 50% of matrix	buried log (impasse)

Table A.1. Shovel/Auger Test Results, by Test Number.

Test No.	Parcel No.	Depth (cmbs)	Sediments	Interpretation	Comments	Reason for Termination
18	189	0-80	dark brown silt with red/oxidized mottling	Holocene alluvium	located on two track farm road	
		80-100	gray sands	Holocene alluvium	no gravels	physical limitations due to depth
19	211	0-20	dark brown mottled silt	Holocene alluvium	no gravels	
		20-70	dark gray to gley silt	Holocene alluvium	intermixed with peat	water table (collapsing walls)
20	211	0-20	dark brown silt	Holocene alluvium	no gravels	
		20-80	dark bray to gley silt	Holocene alluvium	intermixed with peat	water table (collapsing walls)
21	211	0-20	dark brown silt	Holocene alluvium	no gravels	
		20-90	dark bray fine sands	Holocene alluvium	no gravels	water table (collapsing walls)
22	211	0-40	dark brown silt loam	Holocene alluvium	no gravels	
		40-60	gray to gley silt	Holocene alluvium	intermixed with peat	
		60-80	gray fine sands	Holocene alluvium	intermixed with peat	water table (collapsing walls)
23	211	0-20	dark gray silt loam	Holocene alluvium	no gravels	
		20-55	gray to gley silt	Holocene alluvium	intermixed with peat	water table (collapsing walls)
24	211	0-20	dark brown silt loam	Holocene alluvium	no gravels	
		20-80	gray to gley silt	Holocene alluvium	woody debris throughout, no gravels	
		80-105	gray fine sands	Holocene alluvium	woody debris throughout, no gravels	sands falling out of auger
25	130	0-20	brown sandy loam	fill material	modern debris present	
		20-40	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	
		40-100	dark brown silt		no gravels	physical limitations due to depth
26	130	0-40	dark brown sandy loam	Holocene alluvium	compacted, no gravels	
		40-60	light brown silt loam	Holocene alluvium	loose, no gravels	
		60-105	gray fine sands	Holocene alluvium	no gravels	physical limitations due to depth
27	130	0-40	brown silt loam	Holocene alluvium	compacted, no gravels	
		40-100	brown silt loam	Holocene alluvium	loose, no gravels	physical limitations due to depth
28	130	0-50	dark brown silt loam	Holocene alluvium	compacted, no gravels	
		50-90	dark brown silt loam	Holocene alluvium	loose, no gravels	
		90-100	dark brown silt with red/oxidized mottling	Holocene alluvium	loose, no gravels	physical limitations due to depth
29	130	0-10	dark brown silt loam	Holocene alluvium	sod layer, few granule-size gravels	
		10-20	light brown loamy sand	fill material	fill material, pumic push pile, no gravels	
		20-100	dark brown silt loam	Holocene alluvium	no gravels	physical limitations due to depth
30	190	0-80	dark brown silt	Holocene alluvium	no gravels	
		80-200	gray to gley silt	Holocene alluvium	no gravels	physical limitations due to depth
31	190	0-10	dark brown silt	Holocene alluvium	no gravels	
		10-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth

Table A.1. Shovel/Auger Test Results, by Test Number.

Test No.	Parcel No.	Depth (cmbs)	Sediments	Interpretation	Comments	Reason for Termination
32	190	0-60	dark brown silt	Holocene alluvium	no gravels	
		60-85	dark brown silt with mottling	Holocene alluvium	5-in-diameter plastic drain pipe at 65-75 cmbs, mottling from decomposing organics, no gravels	pipe impasse
33	190	0-50	dark brown silt	Holocene alluvium	no gravels	
		50-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth
34	190	0-50	dark brown silt	Holocene alluvium	no gravels	
		50-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth
35	190	0-100	dark brown silt with red/oxidized mottling	Holocene alluvium	no gravels	physical limitations due to depth
36	62	0-100	light brown silt loam	Holocene alluvium	no gravels	physical limitations due to depth

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 8, 2018

Mr. Roger Kiers
WA State Dept. of Transportation
P.O. Box 47332
Olympia, WA. 98512-7332

In future correspondence please refer to:
Project Tracking Code: 080700-51-FHWA
Property: SR 167, Puyallup to SR 509
Re: More Information Needed

Dear Mr. Kiers:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. In response, we have reviewed the materials you provided for this project. First, concur with the results of the subsurface testing portion of the supplemental report. However, we have concerns regarding the property located at 6007 Milwaukee Ave E (Property #680539). Current depiction on Figure 5 in the report shows the property to be within the Project ROW. We are requesting more information on proposed work in the vicinity of this property. Additionally, we are requesting information on the potential sound or retaining wall as the Built Environment staff have concerned about potential indirect effects.

We appreciate receiving copies of any correspondence or comments from concerned tribes and other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the SHPO pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Dennis Wardlaw
Transportation Archaeologist
(360) 586-3085
dennis.wardlaw@dahp.wa.gov

Washington State Department of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

March 8, 2018

Mr. Dennis Wardlaw
Transportation Archaeologist
Department of Archaeology & Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Log: 080700-51-FHWA
RE: SR 167 Extension Project, Puyallup to SR 509 – New Freeway
Response to Request for More Information

Dear Mr. Wardlaw:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the SR 167 Extension Project to address transportation needs in Pierce County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, we are continuing formal Section 106 consultation under delegated authority from FHWA. I am responding to your request for more information regarding project effects in the vicinity of the historic property at 6007 Milwaukee Ave E.

As you pointed out in your letter dated March 8, 2018, the property at 6007 Milwaukee Ave E is shown within the Project ROW on Figure 5 of the most recent cultural resources report. As noted in our letter dated March 1, 2018, the property is in fact now outside the Project ROW due to recent design changes, and the property will no longer need to be acquired. Instead, a retaining wall and potential noise wall would be constructed along the edge of existing ROW adjacent to the property. An exhibit depicting the current project design in this area is enclosed for your reference, showing proposed improvements around the curve from the northbound SR 167 off-ramp to southbound SR 512 (6007 Milwaukee Ave E is labeled "P887" on the exhibit). As previously noted, the retaining/noise wall, if needed, would be 16 feet high.

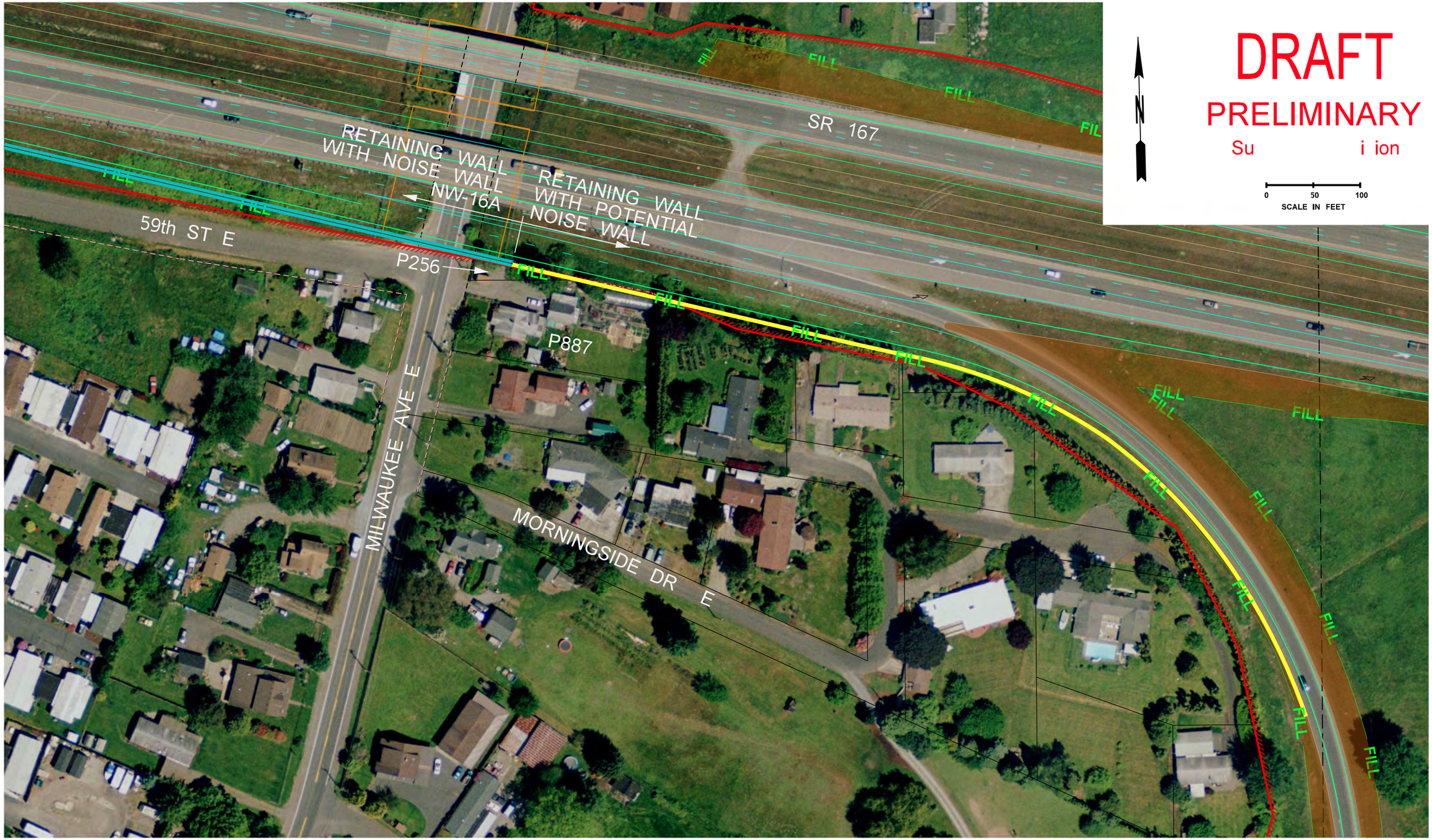
If you have further questions or comments regarding the proposed project, please feel free to contact me.

Sincerely,

Roger Kiers
WSDOT Archaeologist

Enclosures: "Exhibit A"

cc: Dave Davies, WSDOT SR 167 Completion Project



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DRAFT

PRELIMINARY

Su i ion

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SCALE IN FEET

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SR 167 COMPLETION PROJECT
NEW FREEWAY

EXHIBIT A

PIERCE COUNTY

SHEET
OF
SHEETS

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 14, 2018

Mr. Roger Kiers
WA State Dept. of Transportation
P.O. Box 47332
Olympia, WA. 98512-7332

In future correspondence please refer to:
Project Tracking Code: 080700-51-FHWA
Property: SR 167, Puyallup to SR 509
Re: ADVERSE Effect

Dear Mr. Kiers:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. We have reviewed the materials you provided for this project. As a result of our review, we concur with your determination that the project as proposed will have an Adverse Effect on a property listed in, or eligible for listing in, the National Register of Historic Places.

In view of our concurrence on the adverse effect determination, we look forward to further consultation and the development of an amended Memorandum of Agreement (MOA). The amended MOA shall identify specific measures that when implemented will serve to mitigate the adverse effect on the property.

Also, we appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Dennis Wardlaw
Transportation Archaeologist
(360) 586-3085
dennis.wardlaw@dahp.wa.gov

AMENDMENT TO THE MEMORANDUM OF AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION, US ARMY CORPS OF ENGINEERS, AND THE WASHINGTON STATE HISTORIC PRESERVATION OFFICER PURSUANT TO 36 CFR Part 800.6(a) REGARDING THE SR 167 PUYALLUP TO SR 509 PROJECT, PIERCE COUNTY, WASHINGTON

WHEREAS, the original Agreement was executed in November 2006 and amended in December 2009 and May 2013;

WHEREAS, the undertaking's design has been modified since the amended agreement was signed in 2013, and the project will have an adverse effect upon three additional properties determined eligible for inclusion in the National Register of Historic Places (NRHP), thus warranting this amended agreement; and

WHEREAS, the Federal Highway Administration (FHWA) has notified the Advisory Council on Historic Preservation (ACHP) and will send a copy of this executed amendment to the ACHP;

NOW, THEREFORE, in accordance with Stipulation 7 of the original Agreement, FHWA, the United States Army Corps of Engineers Seattle District (COE), and the Washington State Historic Preservation Officer (SHPO) agree to amend the Agreement to include the following Stipulations:

STIPULATIONS

FHWA will ensure that the following measures are carried out:

1. Historic Property Documentation:
   WSDOT will complete documentation of the historic properties at 4403 Freeman Rd. E, 6007 Milwaukee Ave. E, and 6020 8th St. E, to Department of Archaeology and Historic Preservation (DAHP) Level 2 standards. For the properties at 4403 Freeman Rd. E and 6020 8th St. E, WSDOT will record the interiors in addition to the exteriors.

2. Historic Structure Salvage:
   The buildings at 4403 Freeman Rd. E and 6020 8th St. E will be demolished after materials have been salvaged for potential re-use, unless no materials are identified by a building materials salvage company willing to remove materials from the structures. WSDOT will provide DAHP with documentation of contacts made with salvage companies prior to demolishing the structures.

3. Online Documentation and WISAARD Enhancement:
   WSDOT will coordinate with DAHP to place the documentation produced under Stipulation 1 online on the Washington Information System for Architectural and Archaeological Records Data (WISAARD), and to provide funds not to exceed $50,000 to assist DAHP with integrating the administrative database into WISAARD project links.

SIGNATORY PARTY

Federal Highway Administration

By: Daniel Mathis Date: 08/22/2018

Daniel Mathis
Division Administrator

Note: Signatures continued on next page.

SIGNATORY PARTY

U.S. Army Corps of Engineers, Seattle District

By: _____ Date: 8/20/18

for Colonel Mark A. Geraldi
Seattle District Commander and District Engineer

Note: Signatures continued on next page.

SIGNATORY PARTY

Washington State Department of Archaeology and Historic Preservation

By: _____ Date: 8/20/18

Allyson Brooks, Ph.D.
State Historic Preservation Officer

Note: Signatures continued on next page.

INVITED SIGNATORY

Washington State Department of Transportation

By: _____ Date: 8-20-2018

Craig J. Stone, P.E.
Puget Sound Gateway Program Administrator

Note: End of signature pages.

Indirect and Cumulative Effects

COPY TO:	**Project File**
PREPARED BY:	**Carol Lee Roalkvam, Environmental Policy Branch Manager, WSDOT Environmental Services Office**
DATE:	**October 16, 2018**
SUBJECT	**NEPA Re-Evaluation of Phase 1, SR 167 Completion Project**

1. Introduction and Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This memorandum was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS).

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1 - Comparison of Design Components for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

This memorandum reviews the effects from the SR 167 Completion Project's proposed refined alignment which is slightly different than the alignment for the 2006 Build Alternative, the addition of tolling to the project, and other changes since the October 2007 ROD on indirect and cumulative effects and climate change. This memo evaluates the Phase 1 Improvements (defined below) considering current conditions and reasonably foreseeable future projects in the vicinity, and determines what effects the modifications have on the validity of the ROD.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 - Comparison of Design Components for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.

SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)
Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. Methods

To prepare this analysis, WSDOT reviewed the 2006 FEIS and supporting documentation, as well as the updates to each of the discipline studies prepared for the NEPA Re-evaluation of the Phase 1 Improvements. WSDOT reexamined the FEIS sections on indirect and cumulative effects (3.1.2; 3.17), including the *Net Environmental Benefits Analysis* (3.17-2), and the section on "activities contributing to cumulative effects" (3.0).

To update the indirect effects, WSDOT considered interactions between the project's effects to identify ways in which the project contributed to effects further removed in time or place.

In identifying and analyzing potential cumulative impacts WSDOT used Joint Guidance issued by WSDOT, FHWA Washington Division, and the U.S. Environmental Protection Agency Region 10, entitled: Guidance on Preparing Cumulative Impact Analyses (2008).

WSDOT relied on the information in the discipline-specific studies and the regional and local studies referenced in the Land Use and Socioeconomics Technical Memorandum (WSDOT 2018a). WSDOT considered whether there was any new potential for cumulative impacts to all resource areas analyzed in the NEPA Re-evaluation. Consistent with the Joint Guidance, the analysis of cumulative effects focused on the resource areas where potential direct and indirect effects were identified. If there are no project related impacts or temporary effects are fully mitigated, then these actions are not likely to contribute to a cumulative effect on a particular resource.

In the FEIS (page 3-9), the following resources were evaluated for cumulative impacts:

- Water Resources
- Wetlands
- Wildlife, Fisheries and Threatened and Endangered Species
- Land Use, Socioeconomic Impacts, and Environmental Justice
- Farmland
- Cultural Resources

This technical memo evaluates the other resources where the project has either positive or negative direct or indirect effects. This analysis also required an update to reasonably foreseeable future projects. WSDOT updated the status of the future projects discussed in the 2006 FEIS by reaching out to the Port of Tacoma, Puyallup Tribe, and local governments in the SR 167 Project area. WSDOT also accessed the Washington State Department of Ecology's "SEPA Register" as recommended by the 2008 joint guidance.

WSDOT compiled information from two SEPA Register searches via Ecology's website: https://fortress.wa.gov/ecy/separ/Main/SEPA/Search.aspx. The first search documented projects filed between 1/1/2010 and 12/15/2015 for the Cities of Milton, Edgewood, Fife, Federal Way, Puyallup, and Tacoma. Projects filed for Pierce County were also reviewed if they were within a mile of the project area. The second search of the similar areas was conducted in June 2018, and downloaded projects for January 2016 to June 6, 2018. Using similar methods, the list of projects was then sorted and mapped to determine which of those projects would be located within the study area. Those projects within a 1-mile buffer were then included as "reasonably foreseeable future projects" for the purposes of this cumulative effects Analysis. The results of these searches are documented below.

4. What has changed in the affected environment since 2006?

As noted in the 2006 FEIS, activities occurring within the study area that are likely to contribute to cumulative impacts include additional state and local road projects, continued commercial and industrial development, the planned expansion of the Port of Tacoma, and development associated with local public facilities such as sports parks, pedestrian trails, and schools.

Significant land use changes and highway improvements since 2006 are described below. In addition, data gathered from the SEPA Register since the completion of the FEIS is provided to further illustrate development trends in and around the SR 167 Project area.

Development Trends

The trends reported in the 2006 FEIS are still accurate, and include:

- Expansion of shipping operations at the Port of Tacoma. To accommodate anticipated increase in container volumes, the Port plans to expand existing terminals and develop terminals for new clients. Simultaneous with terminal expansion the Port plans waterway, rail, and road infrastructure improvements. (Personal communication from Port of Tacoma's Christine Wolf to Steve Fuchs on 7/24/18).
- As projected in the 2006 FEIS, industrial/manufacturing and commercial development of vacant, buildable parcels in Fife, Milton, and Puyallup valley area has occurred at a fast pace.
    - For example, the full build out along Freeman Road SE between Valley Ave on the south and 20th Ave E on the north has been completed. This (development) continues to involve conversion of agricultural and open space within the urban areas of Fife, Milton, and Puyallup to industrial, commercial, and residential uses, such as the proposed CMC Heartland development of 850 homes and condominiums, a 150-bed assisted-living facility in Fife. (Personal communication from Steve Friddle, City of Fife Development Director to Steve Fuchs on 8/27/18).
    - The FEIS anticipated development in the City of Milton at the Lloyds, Inc. Recent status from the city is that the development is on hold. The city has been working with the owners of the Lloyds property for several years in an effort to facilitate sale of the property for commercial use. There have been, to date, at least two separate proposals from development companies. Both of these proposals involved the construction of warehouses (Personal communication from Mark Howlett to Steve Fuchs on 7/24/18).
    - Development of Puyallup Tribal properties in the Port of Tacoma and the Fife/Puyallup valley. The tribe has been working on the construction of a new Emerald Queen Casino and parking garage near Portland Avenue in Tacoma.
    - Development of Pacific National Soccer Park. This initiative by the City of Fife fell through and WSDOT purchased the property for the SR 167 Completion project.

Transportation Projects Update

- Planned transportation system improvements in the vicinity of the proposed SR 167 Completion Project as identified in the Pierce County Six-Year Improvement Program (Puget Sound Regional Council 2000) are:
    - Widening and reconstructing Canyon Road to extend north from Pioneer Way to connect with 70th Avenue East. This roadway would link the planned Port of Tacoma employment center in Frederickson with the Port of Tacoma and northward. This

project continues to move forward with environmental documentation and ROW acquisition. Construction funding has not yet been secured.
    - Widening and reconstructing Valley Avenue from Freeman Road East to 20th Street East. This project is complete.

- Planned transportation system improvements in the vicinity of the proposed SR 167 Completion Project as identified in the WSDOT Highway System Plan (WSDOT 1998) and Destination 2030 (PSRC 2001 are:
    - Improving the connections between SR 18, I-5, and SR 161 ("Triangle Project"). Phase 1 is complete, Phase 2A and some of Phase 2B is funded by the 2015 Connection Washington revenue package.
    - Widening SR 161 from 36th Street to I-5. The project that widened SR 161 from 36th St. to Jovita Blvd. is complete. WSDOT is unsure if there are future plans for any more widening from Jovita to I-5.
    - Constructing Core HOV lanes along I-5 from Seattle to SR 512. This work is progressing. Three projects are nearing completion by 2019 and the final project (southbound Puyallup River Bridge) will begin in early 2019 with completion expected by 2022, at which time HOV lanes will be continuous from SR 16 in Tacoma to Seattle.
    - Constructing Core HOV lanes along SR 167 from Puyallup to Seattle. High-Occupancy Toll (HOT) lanes have been constructed from I-405 to near 8th St. in Pacific along southbound SR 167. Also, the HOV direct connect ramps at the SR 167/I-405 interchange is currently under construction and expected to be complete by mid-2019. The HOT lane for northbound SR 167 construction is complete from SR 18 to I-405. A project is now funded that will build an HOV lane from SR 410 to connect with the HOT lane at SR 18 with construction beginning in 2019.
    - Widening SR 16 from the Tacoma Narrows Bridge to I-5, to include SR 16/I-5 interchange improvements. The widening of SR 16 is complete and the I-5/SR 16 interchange is under construction and expected to be complete in 2020.

- Transit Improvements, for example Sound Transit's commuter rail to Lakewood is complete.

Comprehensive Plans

As noted in the Land Use and Socioeconomics Technical Memorandum (WSDOT 2018a), all of the local jurisdictions have recently updated their comprehensive plans, zoning maps, and related regulations in compliance with the Growth Management Act (RCW 36.70A) as part of the required eight-year GMA update process. Based on the review of the local comprehensive plans and related regulations, there has been no change in land use plans that would cause the proposed SR 167 Phase 1 Improvements alignment to be incompatible with adjacent land uses or inconsistent with adopted plans.

Tables 2 lists the reasonably foreseeable future projects from a SEPA Register search conducted in December 2015. There are four projects (shown in bold text) in the SR 167 Project area. Adjacent to the project area, there are several more proposed developments. These findings are consistent with the development trends identified in the 2006 FEIS as occurring with or without the project.

Table 2: SEPA Register Results (2010–2015) [Note, bold text identifies reasonably foreseeable future project that are within the SR 167 Project area.]

Residential Development	**Jurisdiction**
Cruz short plat – divide 1.48 acres into two single-family building lots and wetland buffer area at 407 Comet Street.	**Milton**
Commercial Development	**Jurisdiction**
Tacoma RV -- construct new RV display parking lot and landscaping at 6224 16th Street East.	Fife
Hogan and Bigelow -- expand existing RV sales lot at 5312 Pacific Highway East.	Fife
Ram Brewery -- construct 12, 044 sq. ft. extension to existing brewery to include a tasting room and office space at 7326, 26th Street East.	**Fife**
Marine View Ventures -- construct gas station and 12,225 sq. ft. grocery and convenience store at the SW corner of SR 99 and 62nd Ave. East.	Fife
Johnny's at Fife – demolish existing gas station to allow expansion of restaurant parking lot by adding 36 spaces at 5217, 20th Street East.	Fife
Car Max LLC – construct a used car dealership on 18.3 acres with an 85,000 sq. ft. building and 20 parking stalls at 800 Valley Avenue NW.	Puyallup
Northwest Motorsports – construct a new 7,700 sq. ft. building for a used car dealership on an existing paved commercial site at 400 Valley Avenue NE.	Puyallup
Verison Wireless – install a new wireless communication facility mounted on an existing light pole at the Puyallup Recreation Center above the sports field lights at 810 Valley avenue NW.	Puyallup
Industrial Development	**Jurisdiction**
Benaroya Capital Company LLC -- construct 7 warehouses and 3 retail buildings at Freeman Rd and 20th.	Fife
Biogenic Reagents LLC - construct a biomass carbonization processing plant at 5111, 4th Street East.	Fife
Panattoni Development Co. -- construct 171,620 sq. ft. industrial building on 8.98 acres with 110 parking stalls and 44 High Dock loading doors, frontage improvements and landscaping at 7012 20 Street East.	**Fife**
Todd Road Distribution Facility – construct 2 office/warehouse buildings (43,917 sq. ft. and 56,840 sq. ft.) and 113 parking stalls at 208 Todd Road NE.	Puyallup
Port 167 Industrial Park (Tarragon) – Construct a 652,227 sq. ft. warehouse/distribution park on a 33.6 acre site with asphalt parking, maneuvering areas, landscaping and storm drainage at the 1300 block of Valley Avenue East.	Puyallup

Delacey – construct 113,000 sq. ft. warehouse with parking, landscaping, water, sewer and stormwater facility on an undeveloped 6.56 acres site on the south side of Valley Avenue.	Puyallup
Duris – construct 196,785 sq. ft. industrial warehouse, 158,231 sq. ft. parking lot, 54,981 sq. ft. storm pond with associated patio, walkway and landscaping, at 4410 86th Avenue, Puyallup	Pierce County

Source: SEPA Register listings for Pierce County and the cities of Edgewood, Milton, Fife, Tacoma, Puyallup and Federal Way filed between 1/1/2010 and 12/15/2015. SEPA Register website visited 12/23/2015.

In order to update the SEPA findings, a second SEPA Register search was conducted in June 2018. The information search was for the years 2016, 2017 and 2018. The comprehensive list of SEPA documents was then sorted and mapped to determine which potential future projects would be located within the SR 167 Project study area. Table 3 below shows those projects within a 1-mile buffer.

Table 3 – Recent SEPA Register search results (2016 - Current)

Those projects within a 1-mile buffer were then included as RFFAs for the purposes of the Cumulative Effects Analysis.

MAP ID	SEPA Number	Issued Date	City	Proposal	Type of Development
1	201603994	7/20/2016	Fife	Fife Auto Mall Expansion; Phase 1- Construct a landscaped, paved and lighted parking lot for new and used cars, employee parking, service vehicle parking and unloading area for vehicle transport trucks on parcel #s 0320013125 & 0320122050. Approximately 423 parking spaces on 4.17 acres. Phase 2 - Construct addition of about 6,192 square feet of Lexus service shop which will include 9 service bays plus space for new car delivery to customers on parcel #0320017013. Some interior remodeling of sales and customer areas will also be completed. Phase 3 - A new 7,875 square foot service shop will be constructed on the Volvo Site (parcel # 0320126019). This will have about 10 service stalls, support space for tools and	Commercial

				parts, plus toilets and a break room for staff.	
2	201602232	5/4/2016	Tacoma	Prologis Park Tacoma; The proposal consists of the construction of up to four office/warehouse buildings totaling approximately 1,746,350 square feet and associated utilities, parking, driveways, and landscaping on an approximate 80.7-acre site. Extension and construction of utilities onsite and offsite includes water (domestic, fire, storm), sanitary sewer, power, natural gas, and other franchise utilities.	Office/warehouse buildings
3	201801205	3/9/2018	Fife	Fife Truck Shop; Construct a two story semi-truck repair shop with 3,894 square feet on the first floor and 1,080 square feet of office space on the second floor. Exterior canopy will cover an additional 924 square feet.	Industrial/office
4	201801284	3/14/2018	Fife	Fife Mixed Use Development; Develop a mixed use building with commercial and residential spaces totaling approximately 37,300 s.f. with a 10,180 s.f. footprint. Commercial area will be approximately 1,904 s.f. split between two suites. 34 residential units are proposed on the remainder of the first floor and floors 2-4. Other improvements include water, sewer, storm and frontage as required by code.	Mixed use development

5	201802035	4/19/2018	Fife	Davis Development - 70th Warehouse and Grocer; Construct an ~14,200 sq. ft. retail grocery store with an option to construct an additional 6,000 sq. ft. storage area dependent on future tenant use and an ~55,000 sq. ft. associated warehouse. Along with building construction the proposed development will also include grading activities, landscaping buffer, paved parking and truck maneuvering areas, stormwater facility, water and sanitary sewer connections and franchise utility improvements. A three lot short plat and a Development Agreement with the City of Fife will also be processed as part of the proposed development. The site was previously graded and filled under separate permits issued by the City of Fife.	Retail grocery store and warehouse
6	201606386	11/28/2016	Fife	Lakeridge Industrial Development; Construct a 36,090 square foot industrial building with related site improvements.	Industrial building
7	201705513	10/18/2017	Edgewood	Edgewood View Estates; Subdivide three existing parcels, totaling 39.24 acres to create 92 single-family residential lots within the City of Edgewood. Project includes construction of required improvements for roadways, utilities, and landscaping.	92 single-family lots
8	201801100	3/5/2018	Puyallup	Valley Avenue Business Park; Construct new 44,090 SF business park building with associated parking and	Business park building

				landscaping on a 3.17-acre site. Office space will occupy 9,000 SF & warehouse will occupy remaining 35,090 SF.	
9	201606312	11/21/2016	Puyallup	Olympic Eagle Distributing; Preliminary Site Plan and land use variance application proposing an expansion (approximately 32,400 square feet) of an existing distribution warehouse. Additional off-street parking is proposed as well. Applicant proposes a variance to reduce/eliminate perimeter landscaping in order to allow off-street truck parking.	Distribution warehouse
10	201606674	12/14/2016	Puyallup	Nautica Business Center; Preliminary site plan review request for construction of two warehouse buildings for high cube storage at 235 & 325 Todd Road NW, Puyallup WA. Building 1 will be 77,850 sf & building 2 will be 50,000 sf. Each will have dock high doors and parking for deliveries.	Two warehouse buildings

Source: SEPA register website: https://fortress.wa.gov/ecy/separ/Main/SEPA/Search.aspx visited on June 6, 1018.

5. Would the Phase 1 Improvements result in any new or significant indirect and cumulative effects compared to the 2006 FEIS Build Alternative?

This section examines the indirect effects separately from cumulative effects.

Indirect Effects

WSDOT examined indirect effects as part of the assessment of direct effects on each resource. The 2006 FEIS identified few indirect effects. This 2018 analysis did not uncover any new indirect effects. The findings are consistent with the 2006 documentation.

The Phase 1 Improvements are anticipated to have similar indirect effects as were associated with the 2006 Build Alternative: By substantially improving travel and accessibility, the SR 167 Project may accelerate short-term planned development in the vicinity of the new freeway interchanges. As noted in the FEIS, market forces, economic conditions, the availability of suitable land, and adequate utilities and public services continue to be major factors in determining the rate of growth and development. The Phase 1 Improvements may have fewer indirect impacts associated with nearby development because they are proposed as a fully tolled facility, based on Legislative intent, and elements like the Park and Ride lots are not included.

The FEIS disclosed how the mitigation tied to the project, especially the RRP, contributes to a beneficial indirect effect on wetlands and water resources in the project area when compared to the No Build alternative (FEIS pages 3-108 to 3-110). With regard to Wildlife, Fish, and Threatened and Endangered Species, the updated analysis for the Phase 1 Improvements confirms the FEIS conclusion of fewer indirect effects from the Build Alternative (FEIS pages 3-178), due to the RRP's creek realignment and restoration which would not otherwise occur.

Finally, as noted in the updated Environmental Justice discipline report, WSDOT did not identify any indirect impacts of the Phase 1 Improvements to environmental justice populations.

Cumulative Effects

The analysis conducted for this memorandum reached similar conclusions as documented in the 2006 FEIS table 3.17-1: Anticipated Cumulative Impacts Compared (page 3-408), repeated below.

Resource (critical resources are shaded)	Build Alternative	No Build – other planned development	Impacts as result of planned growth
Water Resources	Impacts	Impacts	Yes
Wetlands	Impacts	Impacts	Yes
Wildlife, Fish and T&E Species	Impacts	Impacts	Yes
Air	No change	No change	Yes
Noise	Impacts	Impacts	Yes
Energy	Improvements	Impacts	Yes
Hazardous Materials	Improvements	Improvements	Yes
Visual Quality	Impacts	Impacts	Yes
Public Services & Utilities	No change	Impacts	Yes
Land Use	Impacts	Impacts	Yes
Socio-Economic	Improvements	Improvements	Yes
Farmland	Impacts	Impacts	Yes
Displacement, Disruption, and Relocation	Impacts	Impacts	Yes
Transportation	Improvements	Improvements	Yes
Pedestrian and Bike Facilities	Improvements	Impacts	Yes
Cultural Resources	Impacts	Impacts	Yes

No change = No change from baseline; Impacts = anticipated negative cumulative impacts to the resource; Improvements = anticipated positive cumulative impacts to the resource.

The 2006 FEIS described cumulative effects on critical resources, those resources that may experience substantial cumulative change (see page 3-407). The FEIS did not evaluate cumulative effects for those resources that were either positively impacted, or unlikely to be impacted by the 2006 Build Alternative.

For the analysis of the proposed SR 167 Phase 1 Improvements conducted for this memorandum, the WSDOT and FHWA's Joint Guidance (2008) was followed, which recommends cumulative effects be considered for any resource that is directly affected by the current project (whether positively or negatively). This memorandum also discusses an analysis of climate change, consistent with WSDOT's Environmental Manual and current environmental documentation procedures.

5.1 Water Resources

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to cumulative effects on water resources (page 3-84). The FEIS also explained how the RRP would be expected to provide direct and indirect improvements to stream and wetland functions. This analysis updates the assessment of Phase 1 Improvements impacts and benefits. The findings are consistent with those in the 2006 FEIS. Trends for surface and ground water quality remain the same given the development pattern in the study area and adherence to stormwater requirements.

The findings in the updated discipline study are consistent with the FEIS; however the smaller footprint of the proposed Phase 1 Improvements reduces the effects per the Water Resources Technical Memorandum (WSDOT 2018b). In addition, the project continues to include benefits provided by the RRP with regard to reduced floodplain impacts and increased long term resilience.

5.2 Wetlands

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to cumulative effects on wetlands. The FEIS (page 3-112) explains that the project's contribution is not substantial given the land use development trends in the basin irrespective of the project. The findings of the updated discipline study are consistent with the FEIS. The Phase 1 Improvements result in fewer direct impacts to wetlands per the Wetlands Technical Memorandum (WSDOT 2018c). The RRP proposed in Phase 1 Improvements provides similar benefits to what was evaluated in the FEIS. WSDOT anticipates the wetland and riparian function to improve in the immediate project area; however, there are still cumulative impacts. As noted in the FEIS, trends in mitigation ratios and other local protection efforts would help to lessen the amount of direct impacts on wetlands from the increased development in the project area.

5.3 Wildlife, Fish, Vegetation, and Threatened and Endangered Species

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute cumulative effects for Wildlife, Fish, Vegetation, and Threatened and Endangered Species. The most notable effects include increases in summer stream temperatures and toxicants, conversion of habitats, hastened buildout, further fragmentation, and a reduction in available mitigation and restoration areas (page 3-185). The RRP will restore and protect a large area of riparian and wetland habitat and improve stream conditions; however, it is not expected to completely offset cumulative effects. Even with a smaller footprint, Phase 1 has similar findings to the 2006 FEIS.

5.4 Air Quality

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute cumulative effects on air quality. Construction impacts for the proposed Phase 1 Improvements are the same as documented in the 2006 FEIS. The construction of the project may cause minor temporary air quality disturbances from dust and construction-related emissions. The project incorporates measures to control temporary air quality issues during construction. Regarding operational impacts, concentrations of criteria pollutants would continue to be below NAAQS. The Phase 1 Improvements would have no meaningful effect on regional MSAT pollutant burden levels. The interagency Air Quality Consultation partners (EPA, FHWA, PSRC, PSCAA, FTA, and Ecology) determined the project is not one of air quality concern per the Air Quality Technical Memorandum (WSDOT 2018d). The construction and operation of the project is not likely to contribute to cumulative effects on air quality.

5.5 Noise

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project did not assess the potential for cumulative noise impacts. This analysis and the updated noise discipline study show that noise levels are similar between the 2006 Build Alternative and proposed Phase 1 Improvements. Phase 1 has fewer sites impacted by noise, however none of these sites were determined to be eligible for noise walls under the “feasible and reasonable” standard for mitigations per the Noise Technical Memorandum(WSDOT 2018e). Construction noise will be mitigated as described in the Noise memo, consistent with the 2006 FEIS and 2007 ROD. The project in combination with current and future projects is likely to result in a slight contribution to the cumulative road noise in the area.

5.6 Energy and Greenhouse Gas

The 2006 FEIS did not discuss cumulative effects on energy, and at the time of publication, no Greenhouse Gas (GHG) analysis was required. The updated analysis for the Phase 1 Improvements concludes that the smaller footprint would result in less energy use in construction compared to the 2006 Build Alternative, and operational energy use would be slightly less due to reduced congestion on local streets. Greenhouse gas analysis shows the Phase 1 project operation will have a negligible or slightly reduced contribution when compared to No Build, given future emissions are projected to decrease due to improved fuel standards and technology.

5.7 Hazardous Materials

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute to cumulative effects. The Phase 1 Improvements project is not expected to result in discharge of hazardous materials; however there are known pre-existing areas of contamination in the project area from past land uses. For this analysis, we note that hazardous materials are not themselves a resource that would be evaluated for cumulative effects. Hazardous materials can, however, enter the air and water and eventually affect human health and ecosystems. As noted in the Hazardous Materials Technical Memorandum (WSDOT 2018f), there are potential risks of encountering hazardous materials during the construction of the project, and safeguards would be in place to minimize temporary impacts,

including development and implementation of a Spill Prevention Control and Countermeasures Plan (SPCCP) for construction projects. In general, new development projects remediate past contamination and result in improved conditions. If any inadvertent discharges of hazardous materials occur, these will be contained, cleaned up, and adverse effects avoided.

5.8 Visual Quality

The 2006 FEIS did not discuss cumulative effects. The FEIS disclosed direct effects from the Build Alternative, including altered views, increased nighttime light and glare. The project area's visual landscape has become more urbanized without the project, as noted in both the FEIS and the updated Visual Quality Technical Memorandum (WSDOT 2018g). The technical memo states: "the viewshed is no longer flat because it is currently (as of 2018) dominated with large warehouse buildings, commercial and industrial complexes, and the increased industrial character have already created negative impacts to the shrinking agricultural viewshed."

While the overall effects are similar between the 2006 Build Alternative and the Phase 1 Improvements, the reduction from three levels to one level (Diverging Diamond Interchange) under the Phase 1 Improvements will lessen (reduce) the visual impact in the vicinity of I-5 as compared to the full Build Alternative. The direct impacts on visual quality will be mitigated through architectural elements and landscaping. The direct effects of the project combined with the increasing development in the area are likely to contribute a cumulative visual impact.

5.9 Public Services

The 2006 FEIS did not discuss cumulative effects on public services. The FEIS disclosed beneficial and adverse impacts to public services. During construction, delays were anticipated; after construction the transportation improvements would enhance services – giving service providers a new highway facility to use. The updated analysis of Public Services for the Phase 1 Improvements reached similar conclusions. Overall, the project will contribute a minor positive cumulative effect by improving regional and local transportation.

5.10 Utilities

The 2006 FEIS did not discuss cumulative effects on utilities. The FEIS disclosed beneficial and adverse impacts to utilities, including improved stormwater facilities and upgraded sewer connections. The updated analysis conducted for the Phase 1 Improvements reached similar conclusions. Based on the proposed design for Phase 1, a net reduction in utility impacts is anticipated compared to the 2006 FEIS Build Alternative, including a reduction in impacts to overhead electric lines and towers, and reduced impact to the Olympic Pipeline of approximately 5,000 linear feet. Impacts for Phase 1 will be fully mitigated, and work will be closely coordinated with utility owner/operators. The Phase 1 Improvements are not likely to contribute to cumulative effect on utilities.

5.11 Land Use and Socioeconomics

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not create cumulative effects for land use and socioeconomics. The FEIS notes that the conversion of land uses to higher intensity uses is consistent with adopted land use plans and the project is not expected to have negative cumulative effect on movement within or between neighborhoods (FEIS page 3-295).

The Phase 1 Improvements would not affect land use or induce growth and development in the region. As noted in the updated Land Use and Socioeconomics Technical Memorandum (WSDOT 2018a) under potential indirect effects, any future development or redevelopment will be consistent with land use plans and policies for that area. Consistent with the findings in the 2006 FEIS, the Phase 1 Improvements are not likely to contribute to a cumulative effect on land use.

5.12 Displacement, Disruption and Relocation

The 2006 FEIS did not discuss cumulative effects on displacements, disruption and relocation. These are not separate resources. These issues are generally included in the analysis of cumulative effects on Land Use, Socioeconomics and Environmental Justice, described elsewhere within this technical memo.

5.13 Farmland

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would contribute to an adverse cumulative effect on farmland (FEIS page 3-334). The FEIS documented the trend of land use conversion in the region, resulting from urban land use designation and economic pressures on farming in the area. Local zoning changes and economic pressures continue. This analysis confirms this finding. While the Phase 1 Improvements Project has a smaller footprint, it does involve unavoidable impacts to farmlands in general. The 2006 FEIS disclosed permanent conversion to transportation use (FEIS pages 3-330 to 3-332). There are no longer any parcels of land in the Phase 1 Improvements vicinity designated as “Farmland” pursuant to the federal Farmland Protection Policy Act (FPPA) definition. There will be permanent conversion of lands currently in “agricultural use” to a Transportation use. Since cumulative effects considers past, present and future actions, the findings of the 2006 remain similar today.

The mitigating measures described in the FEIS are still valid: WSDOT will work directly with farmers to minimize impacts and provide adequate notice of potential disruptions, and identify circulation options during construction to maintain access; impacts to leased farms will involve negotiation with tenant and land owner; and relocation assistance will be provided to all those who qualify.

5.14 Transportation

The SR 167 Project directly benefits regional and local transportation. Consistent with the 2006 FEIS, with the proposed Phase 1 Improvements, there are beneficial cumulative effects on transportation. Future planned transportation projects that could also affect traffic conditions in the SR 167 Project area were considered for the cumulative effects analysis. The Phase 1 Improvements would contribute a positive cumulative effect on regional and local transportation.

5.15 Pedestrian and Bicycle Facilities, and Transportation Resources

The 2006 FEIS did not discuss cumulative effects on non-motorized travel. The project area has experienced rapid growth, as noted in the land use sections of the FEIS and the updated discipline study of "Pedestrian and Bicycle Facilities, and Transportation Resources." Transit and pedestrian/bike facilities are improving throughout the region to address the needs of all users. The 2006 FEIS provided that SR 167 would be open to nonmotorized travel except for the section from the 54th Ave East interchange in the vicinity of 20th Street. The 2006 FEIS also noted that as volumes increase, FHWA and WSDOT will periodically evaluate the safety of bicycles using the facility (Page 3-393). The Phase 1 Improvements include physical improvements that will benefit transit and other service providers, consistent with the FEIS. However, less of the facility will be open to nonmotorized travel because of safety concerns. A separate shared-use path will be constructed between 8th Street E to SR 99, to allow connection of bicyclists and pedestrians from the existing City of Fife Hylebos / Milgard Nature Area trail system to the east side of I-5. A new 70th Avenue structure over I-5 will provide connection for the active transportation community. The project, in combination with improvements on the local system will provide some improvements for pedestrian and bicycle facilities. The Phase 1 Improvements are not likely to contribute to cumulative effects on non-motorized travel.

5.16 Cultural Resources

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would have cumulative effects to cultural resources in the immediate project area. The findings of the updated "Cultural Resources" studies conducted for the Phase 1 Improvements are consistent with the FEIS. Cumulative effects on prehistoric and historic sites are substantial because of past, present, and future disturbance. The FEIS and Phase 1 studies note that consultations with Puyallup Tribe of Indians avoided additional cumulative effects on traditional cultural properties, which remain mostly undocumented. The original 2006 Memorandum of Agreement (MOA) with SHPO and the Puyallup Tribe, and subsequent Amended MOAs signed in December 2009, May 2013, and August 2018 require mitigation for adverse effects. An Unanticipated Discovery Plan (UDP) as required by the current MOA will be developed to describe procedures if archaeological sites or historic resources are encountered during construction.

5.17 Environmental Justice

The 2006 FEIS concluded the Build Alternative for the SR 167 Extension Project would not contribute cumulative effects on Environmental Justice populations (page 3-322). The 2006 FEIS found that the project would not have disproportionately high and adverse effects on environmental justice populations. The Phase 1 Improvements, considering the changes in alignment and the addition of tolling, are not expected to result in disproportionately high and adverse effects on environmental justice populations, given there will continue to be accessible and convenient un-tolled alternatives.

WSDOT anticipates there will be positive and negative cumulative effects of the Phase 1 Improvements on environmental justice populations in the SR 167 travelshed. The Phase 1 Improvements will contribute to a positive cumulative effect on regional transportation; while the addition of tolling will

likely contribute to a negative cumulative effect on the economic burdens of low-income users of SR 167. As described in the "Environmental Justice" discipline report, tolls on the new proposed SR 167 Phase 1 Improvements will disproportionately affect low-income populations because the cost to use the new facility will represent a higher proportion of their household income than middle and high income users. In combination with rising housing costs in the Pierce County and Washington State's regressive tax system described earlier in the discipline report, tolling the new SR 167 Phase 1 Improvements will have a minor contribution to a negative cumulative effect on economic burdens of low-income motorists in the SR 167 travelshed.

5.18 Climate Change

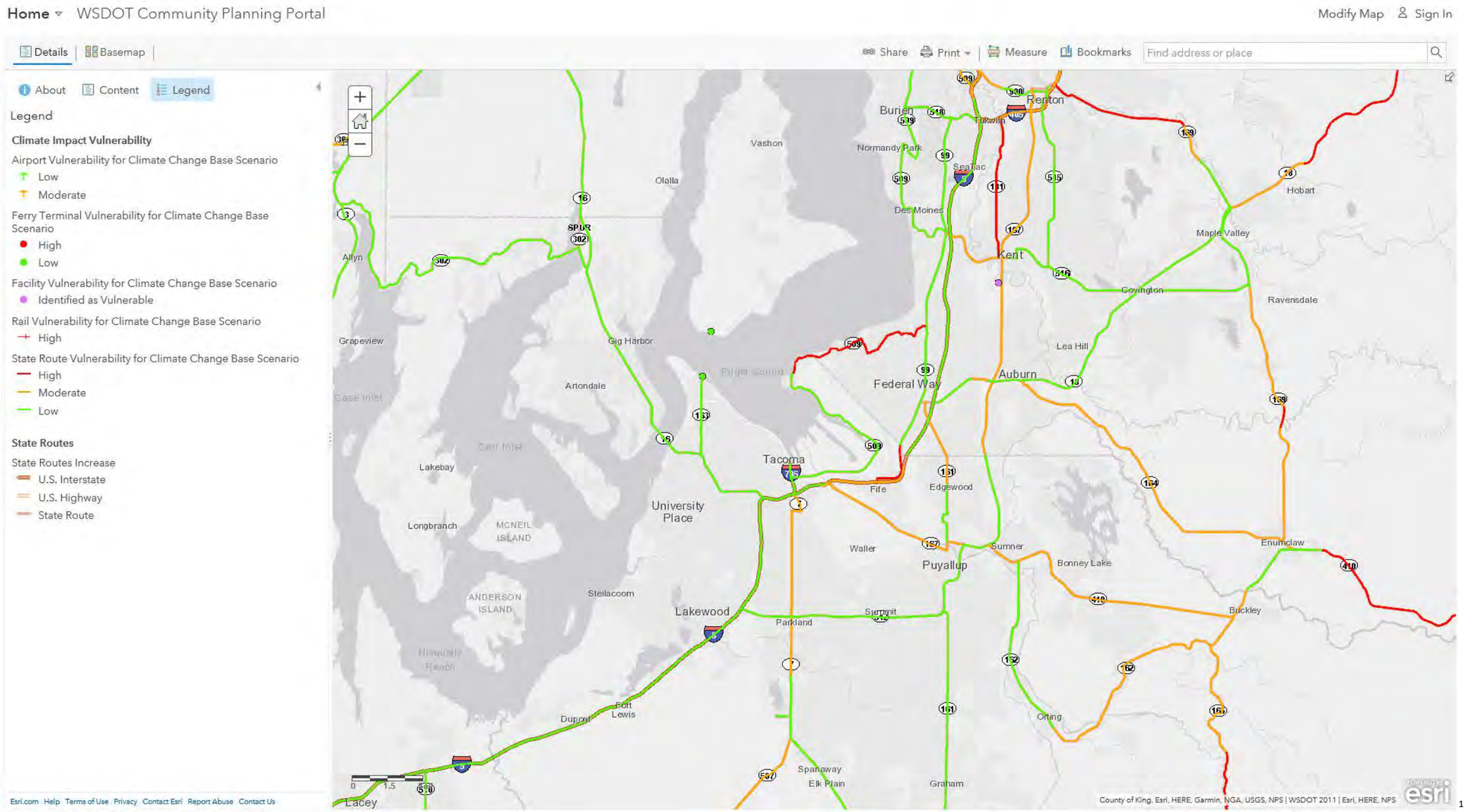
The 2006 FEIS did not address future conditions under climate change.

Understanding future climate threats is essential for a safe and sustainable transportation system. WSDOT assessed all of its existing assets for climate risk (WSDOT 2011 Climate Impacts Vulnerability Assessment). Figure 1 (below) shows the results of WSDOT's statewide vulnerability assessment show the potential climate risks on state-owned transportation assets in the SR 167 project area. Since the proposed Phase 1 Project is a new facility, it was not included in the assessment. However, we can see that the surrounding transportation assets are highly vulnerable to flooding from the Puyallup River and coastal flooding due to gradual sea-level rise. The area is less vulnerable to fire risk or landslides.

The FEIS and this analysis explain how flooding and stormwater affects the project area, and how the RRP helps reduce flood risk and meets or exceeds stormwater control requirements. In addition, the SR 167 project team is participating in a pilot project with the Federal Highway Administration and The Netherlands to better understand the process for analyzing infrastructure projects and identifying adaptation strategies to help mitigate the effects of climate change to public infrastructure. As part of the pilot, WSDOT evaluated potential sea-level rise and its impact on the hydrology of the Hylebos Creek and Surprise Lake Tributary, and further evaluated the riparian strategy with updated climate projections.

The Netherlands and FHWA are interested in the SR 167 Completion Project's innovative approach to riparian restoration and floodplain function as a potential climate resilience feature. The Netherlands is studying a highway expansion project (known as Innova58) in South Holland in an area that experiences heavy downpours, which are increasing as the climate changes, resulting in increased localized flooding and driving safety concerns. These two project teams are exchanging ideas and information to help improve assessment tools and strategies.

Figure 1. WSDOT's Statewide Vulnerability Assessment



[1] Source: 2011 Climate Impacts Vulnerability Assessment

The proposed Phase 1 Improvements are being planned with the most up to date climate science so that the completed project will be durable throughout its planned lifetime and resilient to extreme events.

6. Conclusion

Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Cumulative effects include past, present, and reasonably foreseeable future actions within the study area that, together with the project, may have a cumulative effect on the environment. Cumulative effects were found to be similar between the 2006 FEIS and the proposed Phase 1 Improvements. Trends affecting the resources remain as described in the 2006 FEIS.

References

Puget Sound Council of Governments. (2000). Regional Transportation Improvement Program, Six-Year Improvement Program. OCLC #18150541.

Puget Sound Regional Council. (2001). Destination 2030. Seattle, WA: The Council. 2001.

Washington State Department of Ecology. (2018). SEPA register website: https://fortress.wa.gov/ecy/separ/Main/SEPA/Search.aspx visited on June 6, 2018; visited December 23, 2015 and June 6, 2018.

Washington Station Department of Transportation. (1998). WSDOT Highway System Plan.

Washington State Department of Transportation. (2006). SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation (2006 FEIS). November 2006.

Washington State Department of Transportation. (2008). Guidance on Preparing Cumulative Impact Analysis. Available at: http://www.wsdot.wa.gov/sites/default/files/2017/11/09/ENV-NSEPA_YellowCumEffGuid.pdf

Washington State Department of Transportation. (2011). Climate Impacts Vulnerability Assessment. November 2011.

Washington State Department of Transportation. (2018a). SR 167 NEPA Re-Evaluation Land Use and Socio-Economics Technical Memorandum.

Washington State Department of Transportation. (2018b). SR 167 NEPA Re-Evaluation Water Resources Technical Memorandum.

Washington State Department of Transportation. (2018c). SR 167 NEPA Re-Evaluation Wetlands Technical Memorandum.

Washington State Department of Transportation. (2018d). SR 167 NEPA Re-Evaluation Air Quality Technical Memorandum.

Washington State Department of Transportation. (2018e). SR 167 NEPA Re-Evaluation Noise Technical Memorandum.

Washington State Department of Transportation. (2018f). SR 167 NEPA Re-Evaluation Hazardous Materials Technical Memorandum.

Washington State Department of Transportation. (2018g). SR 167 NEPA Re-Evaluation Visual Quality Technical Memorandum.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Public Services Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Cultural Resources Investigations and Section 106 Concurrence.*

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Displacements, Disruption, and Relocations Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Energy and Greenhouse Gas Technical Memorandum.*

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Environmental Justice Discipline Report*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Farmland Technical Memorandum.*

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Pedestrian and Bicycle Facilities, and Transportation Resources Technical Memorandum.*

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Section 4(f) Evaluation.*

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Transportation Discipline Report*.

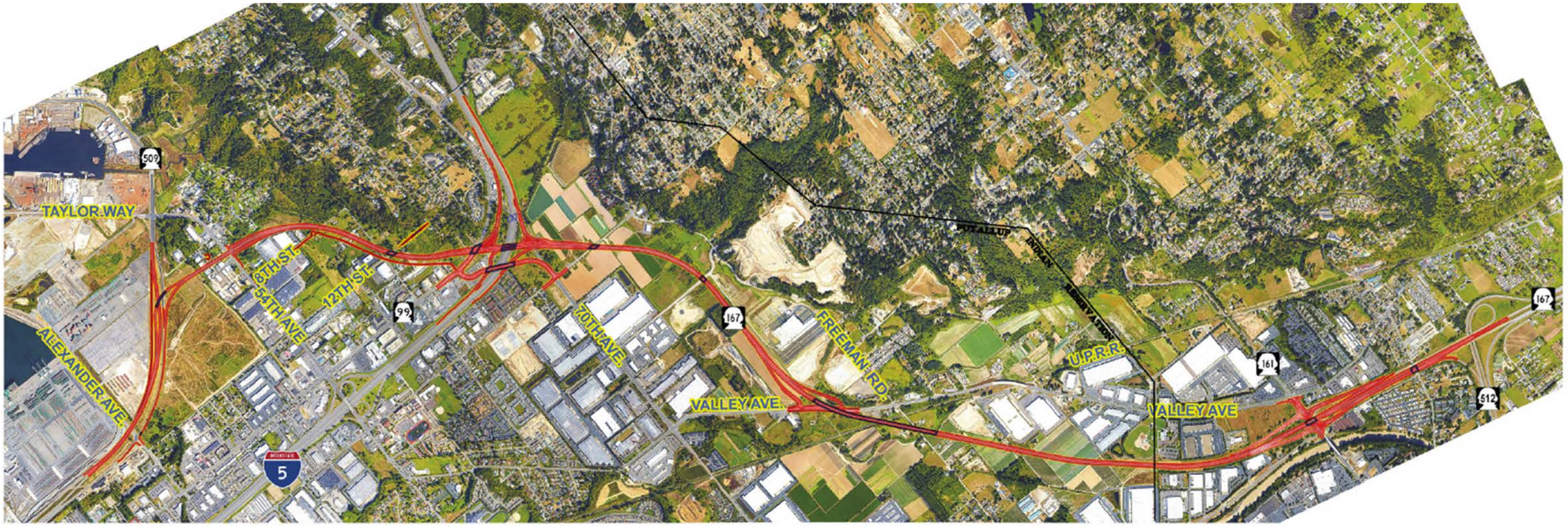
Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Utilities Technical Memorandum*.

Washington State Department of Transportation. (2018). *SR 167 NEPA Re-Evaluation Wildlife, Fish, Vegetation, and Threatened and Endangered Species Technical Memorandum*.

Attachments


TAYLOR WAY
ALEXANDER AVE.
8TH ST.
54TH AVE
12TH ST.
99
5
INTERSTATE
509
70TH AVE.
167
FREEMAN AVE.
VALLEY AVE.
U.P.R.R.
161
VALLEY AVE
512
167

Attachment B – Phase 1 Improvements



Section 4(f) Evaluation

September 11, 2018

1. Background

The SR 167 Completion Project is one of two projects that comprises the WSDOT Puget Sound Gateway Program. This Section 4(f) Evaluation was prepared in support of the Phase 1, SR 167 Completion Project National Environmental Policy Act (NEPA) Re-Evaluation. It compares the changes to the project and resultant impacts (beneficial and/or adverse) against the Record of Decision (ROD) issued by the Federal Highway Administration (FHWA) in 2007 to determine if Phase 1 of the SR 167 Completion Project would result in any new significant impacts not evaluated in the *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement and Section 4(f) Evaluation* (2006 FEIS). The effects of the SR 167 Puyallup to SR 509 Project on resources protected under Section 4(f) of the U.S Department of Transportation Act of 1966 were evaluated in Chapter 5 of the 2006 FEIS. Changes in the project, the FHWA update to Section 4(f) policy issued in 2012, and to the project study area are discussed as they relate to Section 4(f).

The purpose of the SR 167 Completion Project is to improve regional mobility of the transportation system to serve multimodal local and port freight movement and passenger movement between (1) the Puyallup termini of SR 167, SR 410, and SR 512 and (2) the I-5 corridor, the new SR 509 freeway, and the Port of Tacoma. Furthermore, the project is intended to reduce congestion and improve safety on the arterials and intersections in the project area, improve system continuity between the SR 167 corridor and I-5, and maintain or improve air quality in the corridor. The need for the project is to enhance regional freight mobility, reduce congestion, improve safety, improve system continuity, and maintain or improve air quality.

The 2006 FEIS Build Alternative mainline alignment of the SR 167 Project generally consists of a four-lane freeway (four general purpose lanes, two lanes in each direction), and one high occupancy vehicle (HOV) lane in each direction between I-5 and SR 161. See Table 1 - Comparison of Design Components for specifics regarding the scope of the 2006 FEIS Build Alternative.

The 2006 Build Alternative scope did not include tolling. FHWA issued the ROD in October 2007, selecting the preferred Build Alternative. See Attachment A for a schematic drawing of the 2006 Build Alternative.

2. What are the Phase 1 Improvements and how do they compare with the 2006 FEIS Build Alternative?

Since the ROD was issued, the project has moved forward with actions such as the purchase of needed right-of-way (ROW), completion of certain work elements, e.g., the Puyallup River Bridge Replacement Project, and refinements in preliminary design. The Connecting Washington funding package allows for Phase 1 of the SR 167 Completion Project (Phase 1 Improvements) to proceed through the NEPA Re-Evaluation, design, and construction phases. The NEPA Re-Evaluation addresses the design elements from the ROD that are included in the Phase 1 Improvements and does not preclude the environmental

reviews of future phase(s) to achieve the design elements within the ROD that would occur at the time of Legislative direction and funding availability.

The SR 167 Completion Project is wholly within Pierce County in the cities of Puyallup, Fife, Milton, Edgewood, portions of unincorporated Pierce County, and Tacoma. In addition, the majority of the project falls within the Puyallup Tribe of Indians (PTOI) reservation boundary. The current project footprint remains within the limits of the preferred Build Alternative documented in the 2006 FEIS.

The Phase 1 Improvements will complete the SR 167 freeway by building approximately four miles of a new, 4-lane limited-access facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 near the 70th Avenue crossing. The project also includes a new, approximately two-mile highway section from SR 509 near Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509. Phase 1 of the SR 167 Completion Project is proposed as a fully tolled facility based on Legislative intent. See Table 1 - Comparison of Design Components, for specifics regarding the scope of the Phase 1 improvements. Attachment B depicts the Phase 1 Vicinity Map.

The Phase 1 project design does not include center-to-center HOV Direct Connections between I-5 and SR 167, but will not preclude it. Future HOV Direct Connections could be accommodated using a flyover type configuration for the proposed I-5/ SR 167/ SR 509 Spur Diverging Diamond Interchange (DDI). Also, neither of the two Park and Ride lots, nor the two Washington State Patrol Weigh Stations that were included in the 2006 Build Alternative are included as part of Phase 1 elements.

Table 1 compares the design components of the Build Alternative provided in the 2006 FEIS and selected by FHWA in the 2007 ROD, with the proposed Phase 1 Improvements.

Table 1. Comparison of Design Components

Project Elements	Build Alternative (2006 FEIS and ROD)	Phase 1 Improvements (Re-Evaluation)
SR 509 Connection	Direct connection, single lane in each direction, grade separated at Alexander Ave.	Direct connection, single lane in each direction, at grade connection east of Alexander Ave.
54th Avenue East Interchange	Southbound diamond off-ramp and a Northbound loop on-ramp (single lane ramps)	½ SPUI to the East
SR 509 54th Avenue E to I-5	4 lanes (90-ft), 60 MPH posted speed	4 lanes (78-ft), 50 MPH posted speed
I-5/SR 167/SR 509 Interchange	System level interchange, including Direct Connect HOV ramps	Diverging Diamond Interchange. No Direct Connect HOV ramps.
SR 167 I-5 to Valley Avenue	6 lanes (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
Valley Avenue Interchange	Southbound right hand loop off-ramp and Southbound on-ramp (single lane ramps), Northbound diamond off-ramp and on-ramp.	½ Diamond Interchange to the North
SR 167 Valley Avenue to SR 161	6 lanes: (152-ft): 2 GP lanes + HOV lane in each direction, 60 MPH posted speed	4 lanes (78-ft): 2 GP lanes in each direction, 60 MPH posted speed
SR 161 Interchange (Meridian Avenue)	Full SPUI	Full SPUI (Keep existing Levee Rd connection)

Replacement of steel bridge and widening of the existing concrete bridge over the Puyallup River	Yes	No
North Levee Rd to Valley Avenue Connector	Yes	No
70th Avenue East Reconstruction	Yes, including two new roundabouts; one at 70th Avenue E and 20th Street E, and one on the new aligned 20th Street E	Yes, but no roundabouts
Weigh Station facilities per each direction of travel	Yes	No
Toll Points	None	2 total: The first located east of the ramps for the 54th Avenue E interchange; the second located west of the ramps from Valley Avenue
SR 161 and Valley Avenue Park & Ride Lots (2 total)	Yes	No
ROW	Purchase necessary ROW to complete footprint for Full Build	Purchase necessary ROW to complete footprint for Full Build
Riparian Restoration Program (RRP)	Yes	Yes

GP = general purpose; HOV = high-occupancy vehicle; MPH = miles per hour; ROW = right of way; SPUI = single point urban interchange, a 1/2 diamond interchange has an on and off ramp that serves traffic to and from one direction.

3. What has changed in the affected environment since 2006?

In July 2012, FHWA issued a revised Section 4(f) Policy Paper that replaced the 2005 version under which the Section 4(f) analysis in the 2006 FEIS was completed (FHWA 2012). The guidance related to identification and consideration of use of Section 4(f) resources was expanded in 2012 to address *de minimis* impact analysis, and also to expand the guidance on least overall harm among other topics; however, the information contained in Section 5.1.1 of the 2006 FEIS is still applicable for evaluation of the proposed SR 167 Phase 1 Improvements.

Section 5.4 of the 2006 FEIS identified both historic and recreational Section 4(f) resources considered for the preferred Build Alternative. WSDOT has supplemented that identification process with additional review and exploration for cultural and recreational resources for the proposed Phase 1 Improvements. The additional review was undertaken because of the design changes reflected in the Phase 1 Improvements and the length of time that has elapsed since completion of the NEPA documentation and ROD. This 2018 evaluation compares the Section 4(f)-protected resources that would be affected by the Phase 1 improvements to the findings of the 2006 FEIS. Where there would be no change in the effect on the resource, the findings of the 2006 FEIS are unchanged. Updated Section 106 documentation (WA DAHP 2016, WA DAHP 2018a, WA DAHP 2018b, WSDOT 2015, WSDOT 2016, WSDOT 2017, WSDOT 2018a, and WSDOT 2018b) was also reviewed to identify any changes to historic

properties and the "Public Services" Technical Memorandum (WSDOT 2018d) was reviewed for information on parklands. If either the status of the Section 4(f) protection of the resource or the design of the SR 167 Completion Project changed since the 2006 FEIS, then the effects of the Phase 1 Improvements were evaluated consistent with 23 CFR 774 and the guidelines contained in Section 457 of the WSDOT Environmental Manual, and FHWA Section 4(f) Policy Paper (FHWA 2012).

Historic Properties

Since the 2007 ROD, WSDOT has completed additional surveys to identify and document historic properties. The ROD included a finding of Adverse Effect for the SR 167 Completion Project. FHWA and WSDOT have continued Section 106 consultation with the State Historic Preservation Officer (SHPO) and amended the Memorandum of Agreement (MOA) in 2013 between SHPO, FHWA, and the US Army Corps of Engineers. The Department of Archaeology and Historic Preservation (DAHP) director is the SHPO for the State of Washington. These studies and coordination include the following:

Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project–Puyallup to SR 509, Pierce County, Washington dated December 2015. (WSDOT 2015)

Letter to Allyson Brooks, SHPO, dated September 28, 2016 from Roger Kiers, WSDOT Archaeologist. *SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation.* (WSDOT 2016)

Letter to Roger Kiers, WSDOT Archaeologist, dated October 6, 2016 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509.* (WA DAHP 2016)

Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington dated December 2017. (WSDOT 2017)

Letter to Allyson Brooks, SHPO, dated March 1, 2018 from Roger Kiers, WSDOT Archaeologist. *080700-51-FHWA SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation.* (WSDOT 2018a)

Letter to Roger Kiers, WSDOT Archaeologist, dated March 8, 2018 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – Request for more Information.* (WA DAHP 2018a)

Letter to Allyson Brooks, SHPO, dated March 8, 2018 from Roger Kiers, WSDOT Archaeologist. *080700-51-FHWA SR 167 Extension Project, Puyallup to SR 509 – New Freeway – Response to Request for More Information.* (WSDOT 2018b)

Letter to Roger Kiers, WSDOT Archaeologist, dated March 14, 2018 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – ADVERSE Effect.* (WA DAHP 2018b)

Amended Memorandum of Agreement between the Federal Highway Administration, the U.S. Army Corps of Engineers, and the Washington State Historic Preservation Officer Pursuant to 36 CFR Part 800.6(a) Regarding the SR 167 Puyallup to SR 509 Project, Pierce County, Washington executed August 22, 2018. (FHWA et. al. 2018)

The 2015 cultural research investigations' Built Environment survey identified six newly recommended historic properties within the project's revised Area of Potential Effects (APE) eligible for the National Register of Historic Places (NRHP). The 2015 APE is applicable to the Phase 1 Improvements, and is shown in Attachment E. The investigations also determined that five NRHP-eligible historic properties

previously identified in the 2006 FEIS were no longer within the APE for the Phase 1 Improvements. A 2017 cultural resources survey was undertaken to investigate previously unsurveyed areas within the proposed Phase 1 Improvements APE. The 2017 survey did not identify any additional NRHP-eligible historic properties. The six additional NRHP-eligible properties that were identified in the 2015 investigations are listed in Table 2. The letters to and from the SHPO's office document that the SHPO has concurred with WSDOT's determinations of eligibility and effect are included in Attachment F.

Table 2. Recommended NRHP-eligible Historic Properties in the Proposed Phase 1 Improvements APE that were Not Identified in the 2006 FEIS

Physical Address	2016 Section 106 Effect Determination
6020 8th Street E	Adverse Effect
411 Birch Street	No Effect
4403 Freeman Road E	Adverse Effect
6007 Milwaukee Avenue E	Adverse Effect
6020 Milwaukee Avenue E	No Effect
860 64th Avenue	No Effect

Source: WSDOT 2016

Brief descriptions of the properties listed in Table 2 are excerpted from the 2015 cultural research investigations report as follows:

6020 8th Street E

This residence was built in 1955, just as America's love affair with the Ranch Style was achieving full impetus. Diagnostic elements of the style exhibited here include the shallow-pitched roof, the large masonry chimney, the enclosed and widely overhanging eaves, and the attached garage. This is a classic rendition of the hip-roofed, brick-clad version of the Ranch Style. The remarkable clarity of the horizontal lines and the uncomplicated presentation of the architectural features are what give this house the distinction necessary for NRHP eligibility.

411 Birch Street

Real estate records indicate that this house was constructed in 1900, which would make it a very early example of the Craftsman Style, which dominated residential design into the 1930s. Classic elements of the style seen here include the widely overhanging eaves, exposed rafter ends, barge boards, and full-width front porch with battered post supports. The concrete front porch deck supports are new, but otherwise this building retains excellent integrity of both its historic appearance and original construction materials. As an outstanding and early example of a Craftsman house, it is eligible for listing in the NRHP.

4403 Freeman Road E

This house was built in 1953. It is an early example of the Ranch Style, which would gain in popularity in the decade to come. Classic elements present are the shallow-pitched roof with widely overhanging, enclosed eaves, the massive masonry chimney, and the attached garage. The brick header sills and the brick planter are common elements of the brick version of the Ranch Style. The metal sash units of the smaller windows are probably not original. Nevertheless, there is enough integrity of historic appearance and original construction materials to make this house eligible for listing in the NRHP.

6007 Milwaukee Avenue E

This house was built in 1928 as the Craftsman Style was gaining in popularity. Diagnostic elements present include exposed rafter ends and purlins in the open eaves, and the large front porch canopy with masonry piers and battered posts. Some siding of the front porch was missing at the time of survey but is being replaced with appropriate materials. This is the only sign of diminished architectural integrity. The fact that all of the wood sash windows are present, in an area of residential neighborhoods where almost all original windows have been removed, makes this house eligible for listing in the NRHP.

6020 Milwaukee Avenue E

This residence was built in 1925 and is an excellent example of the classic Craftsman Style house. Diagnostic features present include the wide, open eaves with exposed rafter ends, fascia boards, and purlins; a massive exterior masonry chimney flanked by inglenook windows; the full-width front porch with battered posts and brick piers; and the tripartite window of the front. All architectural elements of the exterior appear to be original, making it one of most intact Craftsman Style houses in the Puyallup Valley. It is eligible for listing in the NRHP.

860 64th Avenue

The Joe Young cabin is a rectangular log structure measuring about 16 feet by 12 feet. Puyallup tribal member Joe Young is associated with Puyallup Reservation allotment 174, which corresponds to the cabin and Erickson house location. The Joe Young cabin is a classic example of Native American residential architecture as influenced by the Hudson's Bay Company, the fur trading venture operated at Fort Nisqually, where Joe Young's father was employed. This cabin was built in about 1900 after an older cabin on the property was destroyed in a fire. The V-notched construction was a commonly used technique for joining corners. The plywood roof is a later addition but is likely instrumental in the successful preservation of the cabin itself. The cabin is eligible for inclusion in the NRHP under Criterion C as a surviving example of early log cabin construction, and under Criterion A for its association with Native American presence in the Fife area. The Erikson house and garage/shed do not contribute to the eligibility of the Joe Young cabin.

Properties No Longer within the Proposed SR 167 Phase 1 Improvements APE

The five NRHP-eligible properties that are no longer within the APE are listed in Table 3.

Table 3. NRHP-Eligible Historic Properties Identified in the 2006 FEIS that are No Longer within the APE

Department of Archaeology and Historic Preservation Identification Number	2006 Section 106 Effect Determination	Physical Address	Change
27-4154	Adverse Effect	6803 20th Street E	Phase 1 Improvements design avoids this property
27-4125	Adverse Effect	7001 20th Street E	Property no longer exists
27-4114	Adverse Effect	7717 Valley Avenue E	Property no longer exists
27-4160	Adverse Effect	3423 Freeman Road	Property located outside of Phase 1 Improvements design APE
Fife-A-1	No Effect	Baggenstos Farm	Property located outside of Phase 1 Improvements design APE

Pursuant to the commitments in the 2007 ROD, two of the properties listed in Table 3, 7001 20th Street E and 7717 Valley Avenue E were acquired by WSDOT in 2008. Both houses were documented pursuant to DAHP Level 2 standards as stipulated in the Section 106 MOA (FHWA et. al. 2006). Materials from both houses were salvaged for re-use and the houses were demolished by WSDOT in 2011. There has been no change to status of other historic properties evaluated in the 2006 FEIS.

Recreational Resources

In support of WSDOT's NEPA Re-evaluation for the proposed Phase 1 Improvements, a "Public Services" Technical Memorandum was completed on January 26, 2018. The technical memorandum described changes to recreational resources in the study area since the 2006 FEIS. The City of Fife's proposed Pacific National Soccer Park that was identified in the 2006 FEIS to be located within the study area was subsequently terminated by the City in 2007. Additional recreational resources that are now existing or planned within the study area are listed in Table 4.

Table 4. Recreational Resources Not Identified in the 2006 FEIS

Jurisdiction	Resource	Description
City of Fife	Colburn Park	A 1.46-acre neighborhood park facility adjacent to the Fife Swim Center on 20th Street E.
City of Fife	5-Acre Park	A 5.3-acre neighborhood park that stretches along Radiance Road, immediately south of the railroad tracks, in a linear fashion and is connected by a paved trail. The park offers walking trails, a playground, and other recreational facilities.
City of Fife	Milgard Nature Area	Along with the Hylebos Nature Area that was identified in the 2016 FEIS, this area has been developed into a habitat restoration project. The City operates and maintains the park with the help of volunteer groups.
City of Puyallup	Grayland Park	Located at 601 N Meridian, this 3-acre neighborhood park is adjacent to the Memorial Center and includes a playground and picnic area.
City of Puyallup	Puyallup Skatepark	Located at 1299 4th Street NW, this 10,000-square-foot skatepark is for skateboarders, rollerbladers, and bicyclists. The park also includes spectator seating.
City of Milton	Milton Community Park	Located at Milton Way and 15th Avenue, this 10-acre park includes ball fields, picnic grounds, tennis courts, a children's play area, and Veterans Memorial.
City of Milton	West Milton Nature Preserve	Located at 604 5th Avenue, this property is a nature preserve that includes the east branch of the Hylebos Creek, known as Sweetwater Creek, and its associated wetlands. The park is focused on the rehabilitation of salmon and trout populations.

Based on available information, the recreational resources listed in Table 4 are assumed to be publicly owned, significant, and open to the public, making them eligible for protection under Section 4(f).

One recreational resource identified in the 2006 FEIS, the planned Pacific National Soccer Park, is no longer planned. By late 2006, the City of Fife had decided not to advance the Pacific National Soccer Park and were preparing to develop the property for commercial use. WSDOT subsequently acquired the property from the City of Fife in January 2011.

The planned Lower Hylebos Nature Park identified in the 2006 FEIS has been completed by the City of Fife as the Hylebos Nature Area and is considered in this evaluation as an existing resource (Table 5). The planned Riverfront Trail identified in the 2006 FEIS has been developed by the City of Puyallup as the Puyallup Riverwalk Trail and is considered in this evaluation as an existing resource (Table 5). There has been no change to status of other recreational resources evaluated in the 2006 FEIS.

Summary of Section 4(f)-Protected Properties

Based on the supplemental review of historic properties and recreational resources, Table 5 lists and Figure 1 shows the location of Section 4(f)-protected properties considered in this evaluation.

Table 5. Section 4(f)-Protected Properties within the Phase 1 Improvements Study Area

Type	Property
NRHP-Eligible Historic Property	6020 8th Street E (house)
NRHP-Eligible Historic Property	411 Birch Street (house)
NRHP-Eligible Historic Property	4403 Freeman Road E (house)
NRHP-Eligible Historic Property	6007 Milwaukee Avenue E (house)
NRHP-Eligible Historic Property	6020 Milwaukee Avenue E (house)
NRHP-Eligible Historic Property	860 64th Avenue (house)
Publicly-owned Park	Hylebos Nature Area (identified in 2006 FEIS as planned Lower Hylebos Nature Park)
Publicly-owned Trail	Interurban Trail
Publicly-owned Trail	Puyallup Riverwalk Trail (identified in 2006 Final EIS as the Riverfront Trail)
Publicly-owned Trail	Planned North Levee Trail
Publicly-owned Recreation Center	Puyallup Recreation Center
Publicly-owned Park	Colburn Park
Publicly-owned Park	5-Acre Park
Publicly-owned Park	Milgard Nature Area
Publicly-owned Park	Grayland Park
Publicly-owned Park	Puyallup Skatepark
Publicly-owned Parkland	Milton Community Park
Publicly-owned Park	West Milton Nature Preserve

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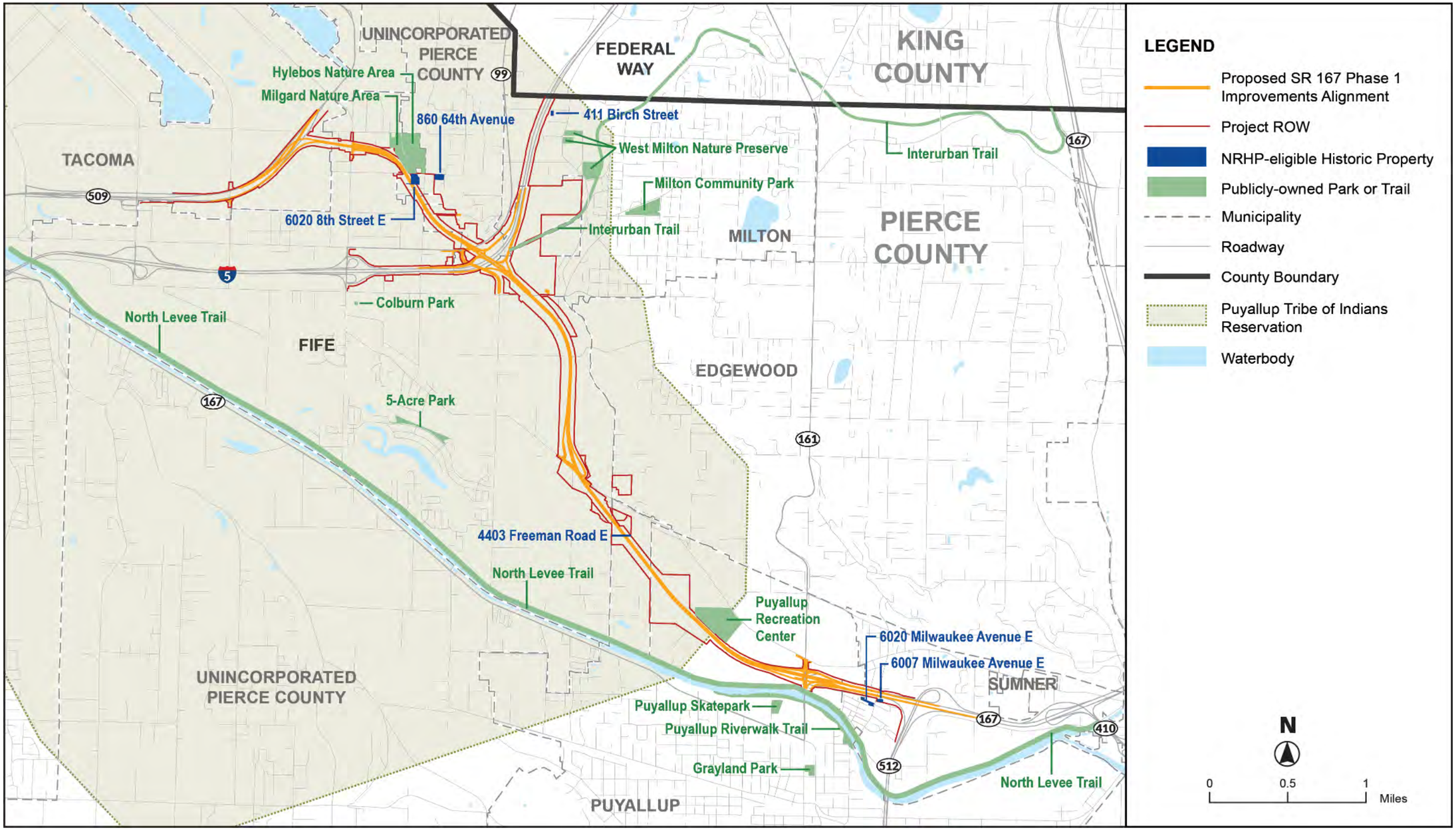

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Figure 1. Section 4(f)-Protected Properties

4. Evaluation of Use

Table 6 summarizes the results of the Section 4(f) evaluation compared to the Section 4(f) findings from the 2006 FEIS. The use of four Section 4(f)-protected properties identified in the 2006 FEIS would no longer occur; however, there would be a use of two additional historic properties that were not identified in the 2006 FEIS. The use of one of those properties also would have occurred with the 2006 FEIS Build Alternative; however, it was not identified as an NRHP-eligible historic property until 2015. The Phase 1 Improvements would result in a use of three Section 4(f)-protected properties: 6020 8th Street E, 4403 Freeman Road E, and the Interurban Trail.

6020 8th Street E

The Phase 1 Improvements would result in a use of this historic residence. The property is within the footprint of the future proposed SR 167 highway alignment and would require demolition and removal. Pursuant to SHPO concurrence (March 14, 2018 letter from DAHP), the structure will be documented to DAHP Level II standards and made available for salvage as mitigation for the adverse effect. The Section 106 MOA was amended on August 22, 2018, to resolve the adverse effect to 6020 8th Street E.

The 2006 FEIS Build Alternative would have acquired the 6020 8th Street E parcel (FEIS Figures 2-2 and 5-6), which included conversion of the parcel to riparian restoration program. The conversion of an NRHP-eligible historic property to natural resource mitigation for the SR 167 Completion Project would have constituted a Section 4(f) use of the property. The property was not identified in the 2005 cultural resource study as an NRHP-eligible historic property; therefore, use of the property was not identified in the 2006 Section 4(f) Evaluation.

4403 Freeman Road E

The Phase 1 Improvements would result in a use of this historic residence. The property is within the footprint of the future proposed SR 167 highway alignment and would require demolition and removal. Pursuant to SHPO concurrence, the structure will be documented to DAHP Level II standards and made available for salvage as mitigation for the adverse effect. The Section 106 MOA was amended on August 22, 2018, to resolve the adverse effect to Freeman Road E.

Interurban Trail

The 2006 FEIS evaluated use of the public Interurban Trail, including measures to minimize harm. The proposed Phase 1 Improvements would implement the commitments to accommodate the Interurban Trail and re-establish the public access connection to the trail that were made in the 2006 FEIS. The Section 4(f) findings from the 2006 FEIS regarding the Interurban Trail remain valid.

Consideration of Constructive Use

Per 23 Code of Federal Regulations (CFR) 774.15, a constructive use occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the property are substantially diminished. Also, FHWA shall determine when there is a constructive use, but FHWA is not required to document each determination that a project would not result in a constructive use of a nearby Section 4(f) property. However, such documentation may be prepared at the discretion of FHWA.

Table 6. Comparison Summary of 2006 FEIS and Phase 1 Improvements Section 4(f) Findings

Resource	2006 FEIS Section 4(f) Use	Phase 1 Improvements Section 4(f) Use	2018 Condition Compared to 2006 FEIS
6803 20th Street E	Use	None	Avoided, property not within limits of Phase 1 Improvements
7001 20th Street E	Use	None	Property no longer exists, demolition after 2006
7717 Valley Avenue E	Use	None	Property no longer exists, demolition after 2006
3423 Freeman Road	None	None	No Change
Baggenstos Farm	None	None	No Change
6020 8th Street E	Not Identified as NRHP-eligible[1]	Use	Evaluated in this 2018 analysis; use under 2006 FEIS Build Alternative not previously identified
411 Birch Street	Not Evaluated[2]	None	No Use
4403 Freeman Road E	Not Evaluated[2]	Use	Evaluated in this 2018 analysis as new resource
6007 Milwaukee Avenue E	Not Evaluated[2]	None	No Use
6020 Milwaukee Avenue E	Not Evaluated[2]	None	No Use
860 64th Avenue	Not Evaluated[2]	None	No Use
Hylebos Nature Area (identified in 2006 FEIS as planned Lower Hylebos Nature Park)	None	None	No Change
Planned Pacific National Soccer Park	Use	No Longer a Planned Facility	No longer a planned facility, property never developed as parkland
Interurban Trail	Use	Use	No Change
Puyallup Riverwalk Trail (identified in 2006 FEIS as the Riverfront Trail)	None	None	No Change
Planned North Levee Trail	None	None	No Change
Puyallup Recreation Center	None	None	No Change
Colburn Park	Not Evaluated[2]	None	No Use
5-Acre Park	Not Evaluated[2]	None	No Use
Milgard Nature Area	Not Evaluated[2]	None	No Use
Grayland Park	Not Evaluated[2]	None	No Use
Puyallup Skatepark	Not Evaluated[2]	None	No Use
Milton Community Park	Not Evaluated[2]	None	No Use
West Milton Nature Preserve	Not Evaluated[2]	None	No Use

[1]The 2006 FEIS Build Alternative included acquisition and demolition of the property at 6020 8th Street E for conversion to riparian restoration program; however, the house at that address was not identified as NRHP-eligible until 2015.

[2]Property not identified as a Section 4(f)-protected resource in the 2006 FEIS.

WSDOT, in consultation with the SHPO, determined that there would be an adverse effect on the residential property at 6007 Milwaukee Avenue E as a result in changes to setting, feeling, and association because of construction of a noise wall between the property and SR 167. The noise wall, which would reduce traffic noise levels at the property, would be located on WSDOT right-of-way and be visible from the property, resulting in a change in setting to the historic property. A constructive use occurs when:

- The noise-level increase caused by the project substantially interferes with the use and enjoyment of a noise-sensitive Section 4(f)-protected property;
- The proximity of the project substantially impairs esthetic features of a Section 4(f)-protected property, where the features are impotent contributing elements to the value of the property;
- The project results in restrictions in access which substantially diminish the utility of the property;
- The vibration impact from construction or operation substantially impairs use of the property; or
- Ecological intrusion of the project substantially diminishes habitat value of a refuge adjacent to the project.

With the potential proposed noise wall, which is the project element nearest to the property, noise levels at the property would be below the FHWA noise abatement criteria. The property is currently adjacent an existing portion of the SR 167 highway and the change to visual setting would be blocking views of traffic on the existing highway, which was constructed more recently than the historic property. The change in non-historic views of the highway would have an effect on setting of the property; however, it would not substantially diminish the historic property. The noise wall would not block the primary views of the building, which are from Milwaukee Avenue E and not from SR 167. The project would not change access to the property. The property is currently adjacent to an existing portion of the SR 167 highway and vibration levels would not change. The property is not a wildlife or waterfowl refuge that would experience ecological intrusion. As a result of these conditions, the project would not have a constructive use on 6007 Milwaukee Avenue E.

The 2006 FEIS and Section 4(f) Evaluation included a determination that there would not be constructive use of the Puyallup Riverwalk Trail or the Puyallup Recreation Center. The proposed Phase 1 Improvements design would not worsen noise, visual, or other proximity impacts to these resources; therefore, there would be no change to the 2006 Section 4(f) determination.

The Hylebos and Milgard Nature Areas are adjacent to the proposed Phase 1 Improvements in Fife. The 2006 FEIS included a determination that there would not be constructive use of the Hylebos Nature Area. The “Noise” Technical Memorandum dated April 18, 2018, completed to support the Phase 1 Improvements NEPA Re-evaluation confirmed that noise levels on the public trails in the Hylebos and Milgard Nature Areas would be less than the FHWA noise abatement criteria. The project would provide enhancement to the nature areas by extending the trail system farther south along Hylebos Creek. Otherwise the conditions have not substantially changed since the 2006 FEIS, and the determination that there would be no constructive use of the Hylebos Nature Area remains valid and would also apply to the Milgard Nature Area.

The other identified public parks and trails are farther removed from the Phase 1 Improvements and do not warrant individual constructive use consideration.

5. Avoidance Alternatives

The 2006 FEIS and Section 4(f) Evaluation investigated a range of avoidance alternatives and determined that there was not a feasible and prudent avoidance alternative to the use of Section 4(f) properties. The Tier I and Tier II analysis remains valid for the project overall. The Phase 1 Improvements would use two individual properties that were not identified in the 2006 FEIS. Analysis of specific alternatives to avoid these two properties is included in this evaluation.

A "feasible and prudent" avoidance alternative is defined in 23 CFR 774 as an alternative that avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting Section 4(f) properties. An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is not prudent if:

- It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- It results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes:
    - Severe social, economic, or environmental impacts
    - Severe disruption to established communities
    - Severe disproportionate impacts to minority or low-income populations or
    - Severe impacts to environmental resources protected under other Federal statutes
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude
- It causes other unique problems or unusual factors or
- It involves multiple factors in [the list above], that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude

The two newly evaluated Section 4(f)-protected properties, 6020 8th Street E and 4403 Freeman Road E, are located at opposite ends of the study corridor and separated by I-5. Because the alignment shift avoidance alternatives evaluated to avoid each property would not affect the other property, the avoidance alternatives for each property are evaluated independently.

Alternatives to Avoid 6020 8th Street E

WSDOT evaluated shifting the alignment of the Phase 1 Improvements either to the north or south of the currently proposed Phase 1 Improvements alignment to determine if there is a feasible and prudent alternative to use of the historic property at 6020 8th Street E.

In the vicinity of 6020 8th Street E, the Phase 1 Improvements alignment is immediately south and southwest of the Hylebos Nature Area and south of the Milgard Nature Area (Figure 1). Shifting the alignment to the north and east would incorporate land from these Section 4(f)-protected resources; therefore, a north shift would not be an avoidance alternative. This alternative is considered below in the analysis of least overall harm.

An alignment shift to the south and west, similar to the Build Alternative identified in the 2006 FEIS, was also considered (Figure 2). The FEIS Build Alternative planned to convert 6020 8th Street E to a riparian restoration program area; however, the parcel would not have been needed for construction of the

highway alignment and could have been avoided, leaving the residential property surrounded by highway and restored riparian habitat.

The south and west alignment shift, following the 2006 FEIS Build Alternative alignment, would result in a loss of access to the property because all local roads that currently access the property would be severed by the SR 167 alignment. As shown on Figure 2, both 8th Street E and 62nd Avenue E would be severed by construction of SR 167. Because SR 167 is a limited access facility, there would not be local access off of the highway onto the severed streets. The current local street right-of-way is planned for inclusion in the project's riparian restoration area, which would include removal of existing pavement and planting for habitat restoration. There would be no means to provide local access to the isolated area containing 6020 8th Street E, which would be cut off by SR 167 to the south and west and bounded by the Hylebos and Milgard Nature Areas to the north (Figure 2).

Loss of all access to the property would not allow the house to remain occupied, which would indirectly result in loss of the historic property. Because the property would not retain the protected features or attributes that qualify it for protection under Section 106, the complete loss of access to the property would also result in a constructive use under Section 4(f). Because of the constructive use, the alignment shift to the south and west, using the 2006 FEIS Build Alternative alignment, would not be an avoidance alternative. This alternative is considered below in the analysis of least overall harm.

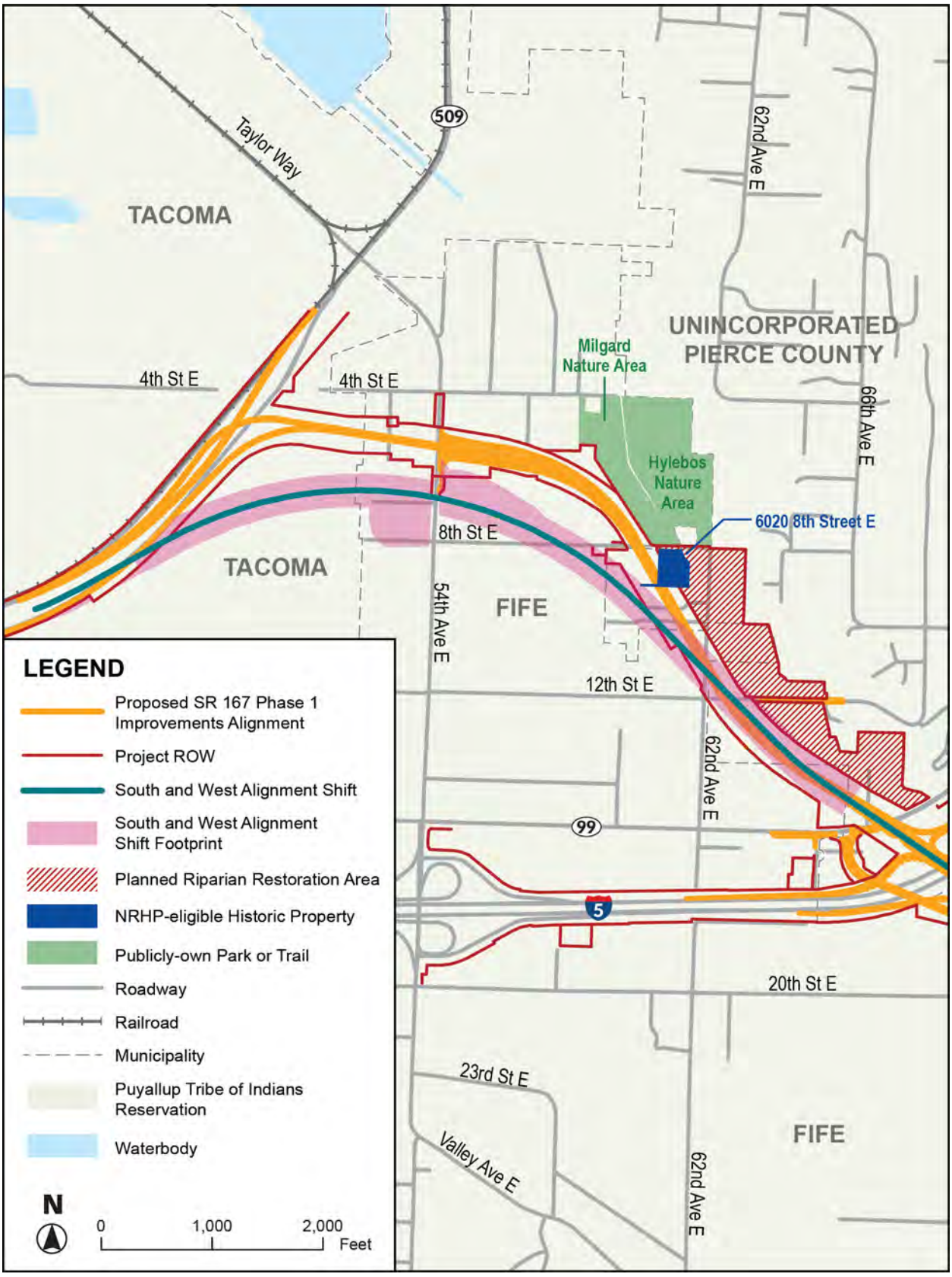


Figure 2. Alignment Shift Option South and West of 6020 8th Street

Summary

As detailed above, alternatives to the Phase 1 Improvements in the vicinity of 6020 8th Street would use Section 4(f)-protected resources. The alternatives are evaluated in Section 6 for Least Overall Harm.

Alternatives to Avoid 4403 Freeman Road E

WSDOT evaluated shifting the alignment of the Phase 1 Improvements either to the north and east or to the south and west of the currently proposed alignment to determine if there is a feasible and prudent alternative to use of the historic property at 4403 Freeman Road E.

North and East Alignment Shift Option

The Puyallup Recreation Center, a Section 4(f)-protected resource, is approximately 3,000 feet east of 4403 Freeman Road E and places a northern constraint on the proposed Phase 1 Improvements alignment as it passes the recreation center (Figure 3). Shifting the alignment north and east at 4403 Freeman Road E to avoid the historic property while remaining south of the Puyallup Recreation Center would place the interchange of SR 167 and Valley Avenue E directly over a horseshoe-shaped bend in Wapato Creek and would also displace commercial development.

The location of Wapato Creek and associated wetlands is shown in Figure 3.3-2 of the 2006 FEIS. The associated 100-year floodplain is shown in Figure 3.2-3 of the FEIS. The location of Wapato Creek and associated buffers were reconfirmed and shown in the Wapato Basin graphic in Attachment C to the "Wetlands" Technical Memorandum completed on February 22, 2018. The graphic is included as Attachment C to this memorandum. The north and east shift would directly impact approximately 2,500 linear feet of Wapato Creek and associated wetlands and floodplains, with the alignment crossing it three times. Chapter 4 of the 2006 FEIS included a Section 404(b)(1) Alternatives Analysis that identified the least environmentally damaging practicable alternative. The north and east shift would significantly increase wetland and aquatic impacts to Wapato Creek relative to the proposed Phase 1 Improvements alignment.

In addition, the alignment shift would require substantial additional property acquisition. One parcel that would require acquisition is in trust ownership for an individual Native American tribe member. WSDOT does not have power of eminent domain over lands in federal trust.

In 2015 and 2016, approximately 960,000 square feet of new warehouse space was constructed within the footprint of the north and east alignment shift. The new warehouse space includes four warehouses (DCT Fife Distribution Center North and South, LSI Logistic Service Solutions, and IAC Port 167). The warehouse space is currently fully leased and operational. The north and east alignment shift would result in closure and removal of the warehouses, which would displace an estimated 480 jobs based on an average logistics employment density of approximately 1 employee per 2,000 square feet of warehouse space. Information has not been compiled regarding whether the displacement of jobs would disproportionately affect Environmental Justice populations.

Including the cost of acquisition of the recently constructed warehouse properties, the north and east shift would increase the cost of the project relative to the current Phase 1 Improvements alignment by approximately $177 Million, which is more than 15 percent of the total anticipated project cost. Estimated right-of-way acquisition requirements and costs are tabulated in Attachment D.

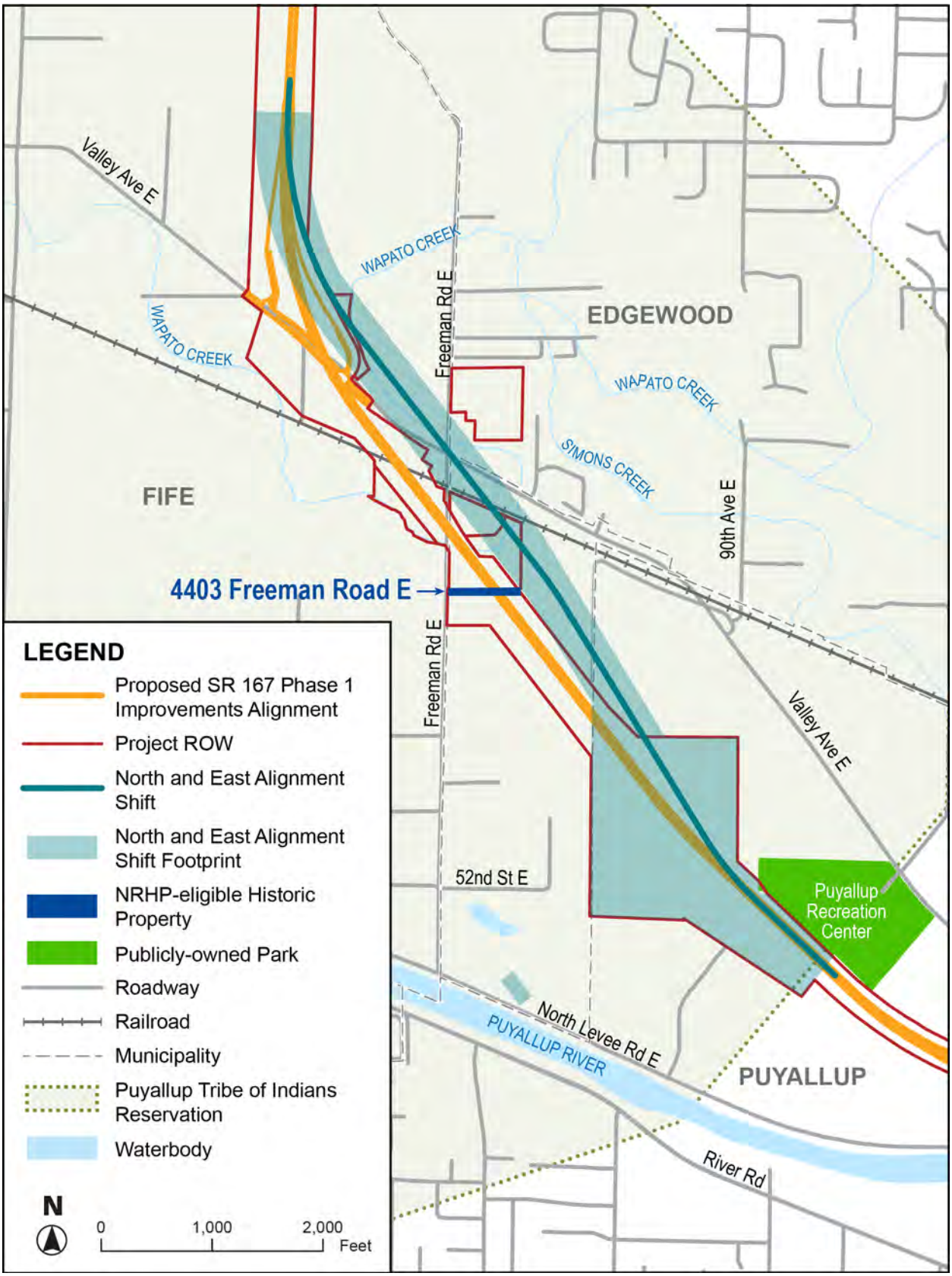


Figure 3. Alignment Shift Option North and East of 4403 Freeman Road E

South and West Alignment Shift Option

Since publication of the 2006 FEIS, large areas of land west of the proposed Phase 1 Improvements alignment have been placed into tribal trust for the PTOI (Figure 4). As described in the FEIS (p 5-30), acquisition of Tribal Trust Lands would be dependent on the PTOI cooperating as willing sellers, and the tribe has indicated opposition to such a sale. Through continued government to government consultation, the tribe has reiterated the importance of the tribal lands. As documented in the Section 4(f) Evaluation (FEIS p 5-40), Tribal Trust Lands function as a constraint preventing shifting the alignment farther west in the vicinity of Freeman Road. The Section 4(f) Evaluation in the FEIS determined that alternatives that require Tribal Trust Lands are not feasible and prudent avoidance alternatives.

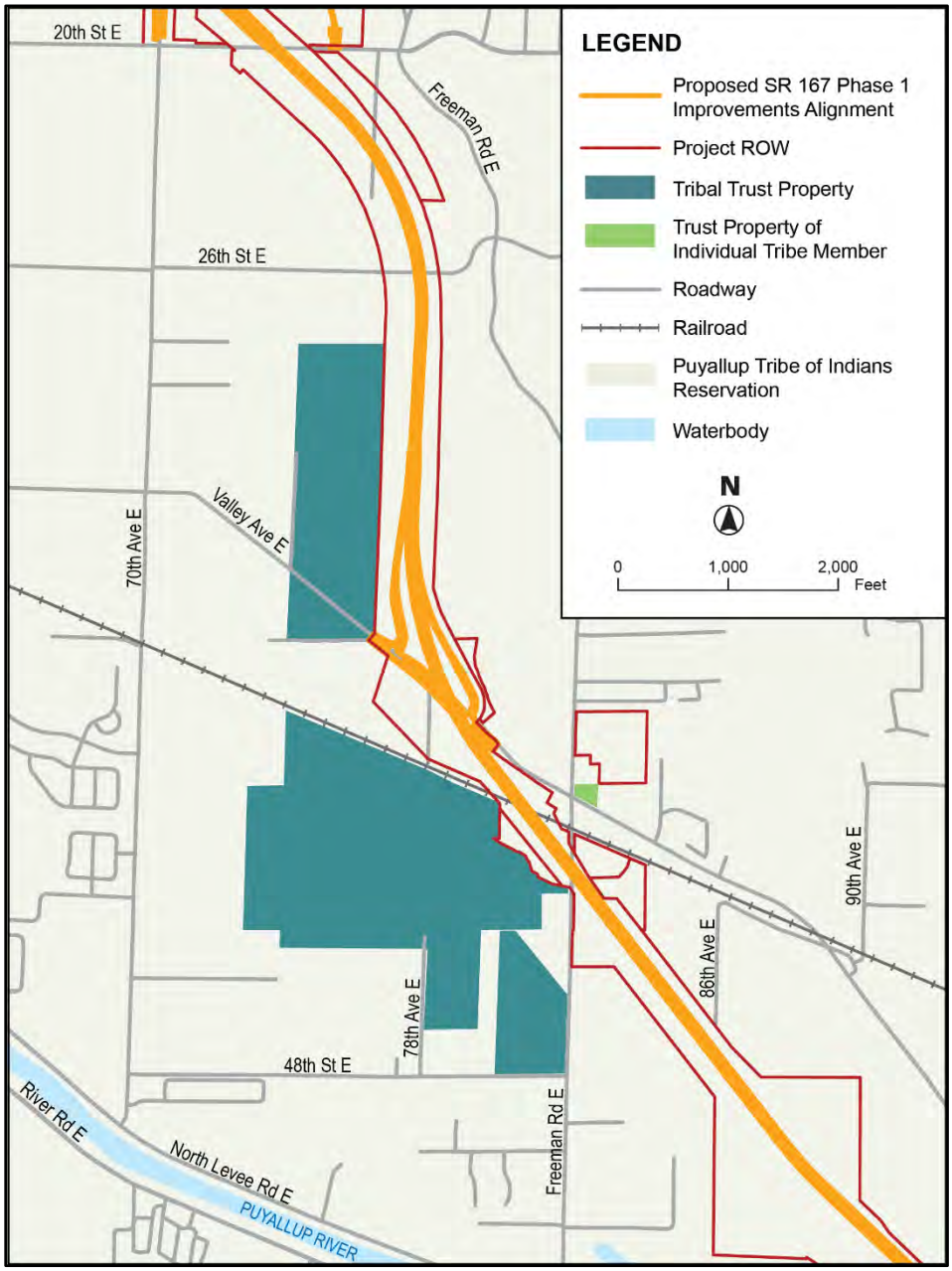


Figure 4. Tribal Trust Lands

Summary

As detailed above, there is not a feasible and prudent avoidance alternative to the use of Section 4(f)-protected resources in the vicinity of Freeman Road. Shifting the alignment north and east would cause severe impacts to waters of the U.S., economic impacts, require acquisition of land in federal trust for a Native American tribe member, and result in extraordinary additional construction costs. Cumulatively, the economic impacts, environmental impacts to resources protected under other federal statutes, and an extraordinary increase in construction costs results in a determination that the north and east shift is not prudent. Shifting the alignment west is constrained by PTOI Tribal Trust Lands, resulting in a determination that the west shift is not feasible.

6. Finding of Least Overall Harm

The documentation completed for the 2006 FEIS continues to remain valid in identifying the project as the Least Overall Harm Alternative. As described above, alternative alignments that would avoid the Section 4(f)-protected property at 6020 8th Street E would use land from other Section 4(f)-protected properties. In accordance with FHWA guidance (FHWA 2012), identifying which alternative would have least overall harm includes consideration of the following seven factors:

- The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- The relative significance of each Section 4(f) property;
- The views of the officials with jurisdiction over each Section 4(f) property;
- The degree to which each alternative meets the purpose and need for the project;
- After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- Substantial differences in costs among the alternatives.

Not all factors are differentiators between all alternatives.

The proposed Phase 1 Improvements and both alignment shift options to avoid 6020 8th Street E would result in the use of Section 4(f)-protected resources (Table 7); therefore, an analysis of which alternative would have the least overall harm is required. The least overall harm analysis does not consider the use of 4403 Freeman Road E because all three alignment options in the vicinity of 6020 8th Street E would have identical use of 4403 Freeman Road E and the above analysis determined that there is not a feasible and prudent avoidance alternative to the use of 4403 Freeman Road E.

Table 7. Summary of Alternatives Considered for Least Overall Harm

Alternative	Section 4(f)-protected Properties with Use
Phase 1 Improvements	6020 8th Street E, 4403 Freeman Road E
Alignment Shift Option North of 6020 8th Street E	Hylebos Nature Area, Milgard Nature Area, 4403 Freeman Road E
Alignment Shift Option South and West of 6020 8th Street E	6020 8th Street E (Constructive Use), 4403 Freeman Road E

Ability to Mitigate Adverse Impacts

Neither the direct use of the historic property at 6020 8th Street E resulting from the proposed Phase 1 Improvements nor its constructive use by the south and west alignment shift could be mitigated to reduce harm to a *de minimis* impact level. Likewise, the use of land from the Hylebos and Milgard Nature Areas with the north alignment shift could not be mitigated to reduce harm to a *de minimis* impact level. As such, there is not a substantial difference in the ability to mitigate impacts among any of the three alternatives.

Relative Severity of the Remaining Harm

The proposed Phase 1 Improvements would require direct use of the historic property at 6020 8th Street E. The south and west alignment shift option to follow the 2006 FEIS Build Alternative alignment would result in a loss of all access to the property, indirectly resulting in loss of the property.

Shifting the alignment to the north of 6020 8th Street E would result in use of publicly owned land from the Hylebos and Milgard Nature Areas, Section 4(f)-protected parklands with walking trails. The Hylebos and Milgard Nature Areas are significant parklands, which the City of Fife *Parks, Recreation and Open Space Plan* (Fife 2014) notes as being developed to restore salmon habitat and provide important passive recreation and environmental education opportunities for the residents of Fife. Shifting the alignment through the nature areas would cut off the southern access point to the public recreational trails and substantially reduce the available recreational area.

As such, any of the three options would have substantial harm to the affected Section 4(f)-protected properties.

Relative Significance of Each Section 4(f) Property

At a combined 24.3 acres, the Hylebos and Milgard Nature Areas are the second-largest parklands in Fife. As such, the nature areas have a greater relative significance than the single isolated historic property at 6020 8th Street E. The north alignment shift option would harm property that is relatively more significant than would be harmed by the other two options.

Views of the Officials with Jurisdiction

The SHPO has concurred with the Section 106 required mitigation for the adverse effect to the historic house at 6020 8th Street E. The City of Fife has noted the significance of the Hylebos and Milgard Nature Areas in its current *Parks, Recreation and Open Space Plan* (Fife 2014). Officials with jurisdiction have documented the significance of both properties.

Degree to Which Each Alternative Meets the Purpose and Need

The 2006 FEIS alignment, the proposed Phase 1 Improvements, the north alignment shift option, and the south and west alignment shift option all would meet the purpose and need.

Magnitude of Any Adverse Impacts to Resources not Protected by Section 4(f)

Because the Hylebos and Milgard Nature Areas are important for their wetland, stream, and wildlife habitat, impacts to those properties by shifting the alignment north would have adverse effects on protected natural habitats that would not occur with the proposed Phase 1 Improvements alignment or the south and west alignment shift option.

The south and west alignment shift option would result in additional residential and business displacements, including primarily manufacturing, research, and warehouse space, compared to the

proposed Phase 1 Improvements and the north alignment shift option. The required displacements are tabulated in Attachment D.

Overall, the proposed Phase 1 Improvements would have the least impact to resources not protected by Section 4(f).

Substantial Differences in Costs

Use of the Hylebos and Milgard Nature Areas would require additional mitigation for impacts to protected streams, wetlands, and wildlife habitat. While these costs may be less than substantial relative to the overall SR 167 Completion Project program budget, the cost of the north shift would be greater than for the proposed Phase 1 Improvements.

Since completion of the 2006 FEIS, the City of Fife and the Port of Tacoma area have experienced substantial development west of I-5. The right-of-way cost estimate for the 2006 FEIS Build Alternative alignment would be approximately $119 Million greater than for the proposed Phase 1 Improvements in the area between 12th Street E and SR 509. Estimated right-of-way acquisition requirements and costs are tabulated in Attachment D. The cost of the 2006 FEIS Build Alternative alignment would be substantially greater than the cost of the Phase 1 Improvements.

Consideration of All Possible Planning to Minimize Harm

The 2006 FEIS documented measures to minimize harm, which remain valid at the overall SR 167 Completion Project level and in relation to the Interurban Trail. Since the affected environment and proposed Phase 1 Improvements have changed over time, and given funding constraints of the Connecting Washington legislation, the project footprint has been reduced and the alignment shifted to minimize harm. Consistent with the 2006 FEIS commitments and subsequent ROD, the proposed Phase 1 Improvements would accommodate the Interurban Trail and re-establish/maintain the public access connection to the trail.

As documented in the March 1, 2018, correspondence with the SHPO, the SR 167 Project's design was changed to avoid use of the NRHP-eligible historic property at 6007 Milwaukee Avenue E. For the two NRHP-eligible historic properties that will be used by the project (demolished) and adversely affected under Section 106, WSDOT will meet the requirements of the Section 106 Amended MOA dated August 22, 2018 (FHWA et. al. 2018) to mitigate for loss of the properties.

Summary

The overall harm to Section 4(f)-protected property would be less for the proposed Phase 1 Improvements than if the alignment were shifted north to use land from the Hylebos and Milgard Nature Areas or south to follow the 2006 FEIS Build Alternative alignment. The north alignment shift would affect resources that are relatively more significant and would cause harm to protected wetland, stream, and wildlife habitat. The south and west alignment shift option would result in a constructive use of the same Section 4(f)-protected property as the proposed Phase 1 improvements, would result in additional business displacements, and would cost substantially more than the Phase 1 Improvements.

7. Coordination

FHWA and WSDOT have engaged in continued consultation and coordination related to Section 4(f)-protected properties since completion of the 2006 FEIS and 2007 ROD. Project changes that have resulted from the proposed Phase 1 Improvements design have been coordinated with the SHPO as documented in the following correspondence, which are included in Attachment F:

Letter to Allyson Brooks, SHPO, dated September 28, 2016 from Roger Kiers, WSDOT Archaeologist. *SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation*

Letter to Roger Kiers, WSDOT Archaeologist, dated October 6, 2016 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509.*

Letter to Allyson Brooks, SHPO, dated March 1, 2018 from Roger Kiers, WSDOT Archaeologist. *080700-51-FHWA SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation*

Letter to Roger Kiers, WSDOT Archaeologist, dated March 8, 2018 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – More Information Needed.*

Letter to Allyson Brooks, SHPO, dated March 8, 2018 from Roger Kiers, WSDOT Archaeologist. *080700-51-FHWA SR 167 Extension Project, Puyallup to SR 509 – New Freeway – Response to Request for More Information.*

Letter to Roger Kiers, WSDOT Archaeologist, dated March 14, 2018 from Dennis Wardlaw, Department of Archaeology and Historic Preservation. *Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – ADVERSE Effect.*

The draft of this Section 4(f) Evaluation detailing the updated Section 4(f) Evaluation was circulated to the U.S. Department of the Interior per 23 CFR 774.5 for review prior to FHWA making its final determination. On July 17, 2018, the U.S. Department of the Interior Regional Environmental Officer responded that the department has no objection to Section 4(f) approval of this project.

8. Conclusion

The 2006 FEIS and Section 4(f) Evaluation concluded that there was no feasible and prudent alternative to the use of land from Section 4(f)-protected properties and the proposed action included all possible planning to minimize harm resulting from such use. That analysis is unchanged for the Interurban Trail. For the two NRHP-eligible historic properties now identified for use by the proposed Phase 1 Improvements (6020 8th Street East and 4403 Freeman Road East), this analysis concludes that there is no feasible and prudent alternative to the use of land from the two properties, and that the Phase 1 Improvements include all possible planning to minimize harm and constitute the alternative with least overall harm.

References

FHWA 2006	United States Department of Transportation. Federal Highway Administration. November 9, 2006. *SR 167 Puyallup to SR 509 Tier II Final Environmental Impact Statement.*
FHWA et. al. 2006	United States Department of Transportation. Federal Highway Administration. November 8, 2006. *Memorandum of Agreement between the Federal Highway Administration, the U.S. Army Corps of Engineers, and the Washington State Historic Preservation Officer Pursuant to 36 CFR Part 800.6(a) Regarding the SR 167 Puyallup to SR 509 Project, Pierce County, Washington.*
FHWA 2012	United States Department of Transportation. Federal Highway Administration Office of Planning, Environment, and Realty Project Development and Environmental Review. July 20, 2012. Section 4(f) Policy Paper.
FHWA et. al. 2018	United States Department of Transportation. Federal Highway Administration. August 22, 2018. *Amended Memorandum of Agreement between the Federal Highway Administration, the U.S. Army Corps of Engineers, and the Washington State Historic Preservation Officer Pursuant to 36 CFR Part 800.6(a) Regarding the SR 167 Puyallup to SR 509 Project, Pierce County, Washington.*
FIFE 2014	City of Fife. 2014. *Parks, Recreation and Open Space Plan.*
USDOI 2018	U.S. Department of the Interior. July 17, 2018. Letter to Dave Davies, WSDOT, from Allison O'Brien, Regional Environmental Officer.
WA DAHP 2016	Washington State Department of Archaeology and Historic Preservation. October 6, 2016. Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509.
WA DAHP 2018a	Washington State Department of Archaeology and Historic Preservation. March 8, 2018. Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – More Information Needed.
WA DAHP 2018b	Washington State Department of Archaeology and Historic Preservation. March 14, 2018. Letter to Roger Kiers, WSDOT Archaeologist, from Dennis Wardlaw, Project Tracking Code: 080700-51-FHWA SR167, Puyallup to SR 509 – ADVERSE Effect.
WSDOT 2015	Washington State Department of Transportation. December 2015. *Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project–Puyallup to SR 509, Pierce County, Washington.*
WSDOT 2016	Washington State Department of Transportation. September 28, 2016. Letter to Allyson Brooks, SHPO, from Roger Kiers, WSDOT Archaeologist. SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation.
WSDOT 2017	Washington State Department of Transportation. December 2017. *Cultural Resources Survey to Support NEPA Re-Evaluation of the Washington State Department of Transportation SR 167 Extension Project – Puyallup to SR 509, Pierce County, Washington.*

WSDOT 2018a Washington State Department of Transportation. March 1, 2018. Letter to Allyson Brooks, SHPO, from Roger Kiers, WSDOT Archaeologist. SR 167 Extension Project, Puyallup to SR 509 – New Freeway Cultural Resources Survey Report to Support NEPA Re-Evaluation.

WSDOT 2018b Washington State Department of Transportation. March 8, 2018 Letter to Allyson Brooks, SHPO, from Roger Kiers, WSDOT Archaeologist. 080700-51-FHWA SR 167 Extension Project, Puyallup to SR 509 – New Freeway – Response to Request for More Information.

WSDOT 2018c Washington State Department of Transportation. January 25, 2018. *WSDOT Puget Sound Gateway Program – Phase 1 of the SR 167 Completion Project Noise Technical Memorandum.*

WSDOT 2018d Washington State Department of Transportation. January 26, 2018. *WSDOT Puget Sound Gateway Program – Phase 1 of the SR 167 Completion Project Public Services Technical Memorandum.*

WSDOT 2018e Washington State Department of Transportation. February 22, 2018. *WSDOT Puget Sound Gateway Program – Phase 1 of the SR 167 Completion Project Wetlands Technical Memorandum.*

558

559

Attachments

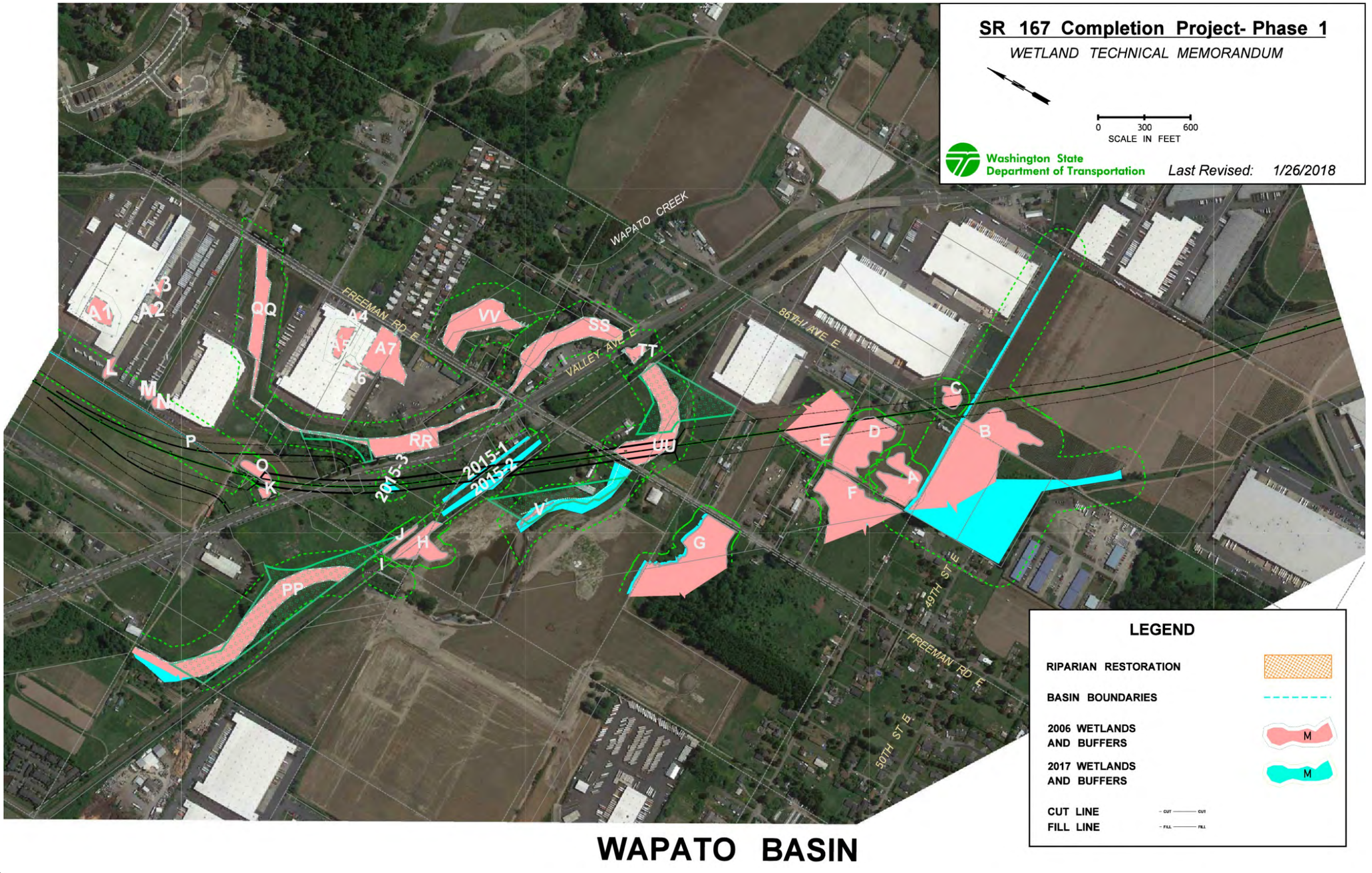
Attachment A – 2006 FEIS Build Alternative



Attachment B – Phase 1 Improvements



603 Attachment C – Wapato Basin



WAPATO BASIN

604 Source: WSDOT 2018e

Attachment D – Property Acquisition Data for Avoidance Alternative and Least Overall Harm Analysis

Property Acquisition Plan Summary for North and East Alignment Shift Option to Avoid 4403 Freeman Road

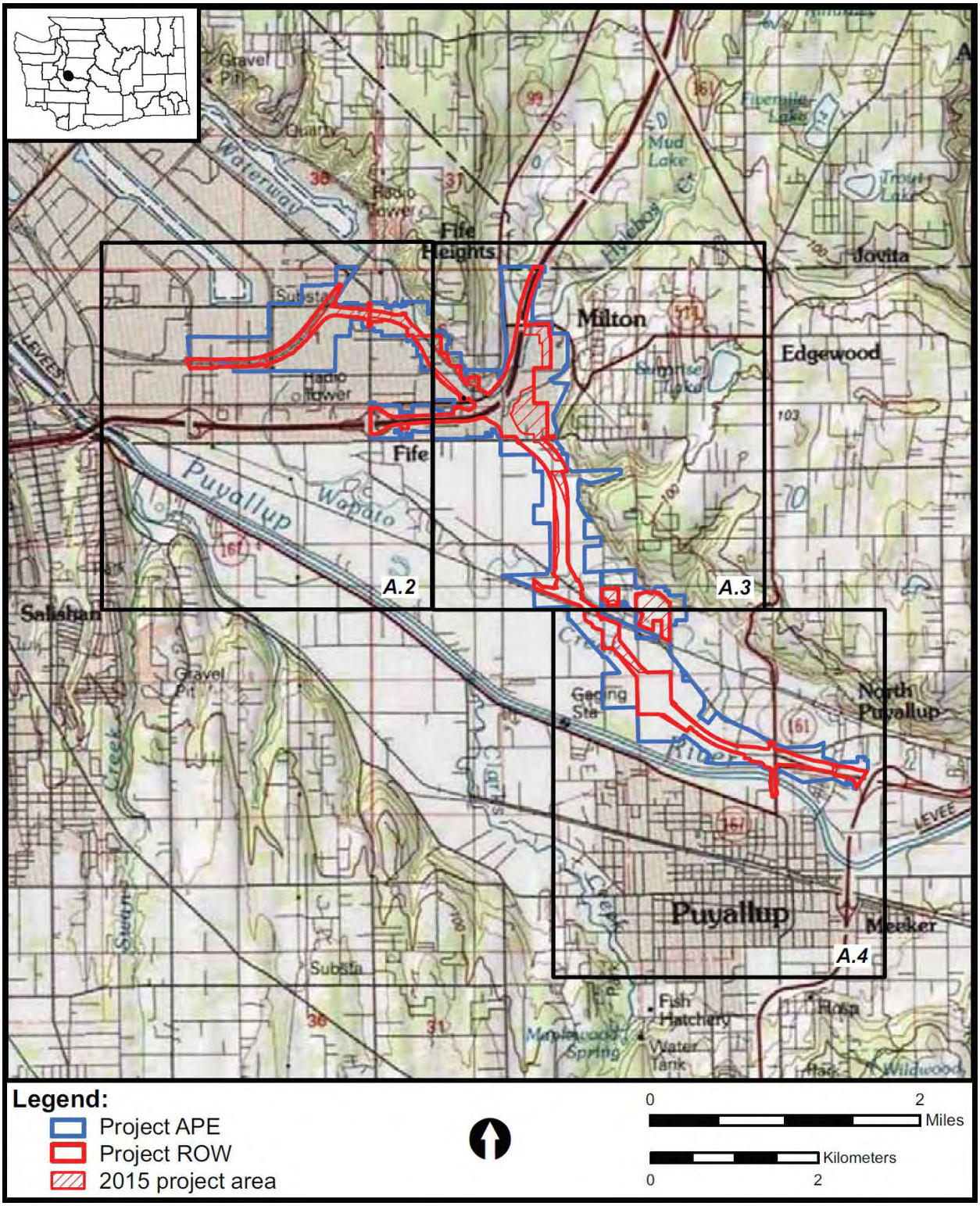
OWNER	TAX PARCEL	Improvements	Relocation	Total Parcel Cost
Suncap Tacoma LLC	420171084	2015- 303,570 SF Mega Warehouse, 2015- 3,130 SF Office BLG, 2015- 5,100 SF Service Garage	Y	$71,000,000
DCT Freeman Road LLC	420171085	2015- 152,328 SF Storage Warehouse	Y	$24,000,000
DCT Freeman Road LLC	420171086	wetlands	N	$300,000
DCT Freeman Road LLC	420171087	2015- 239,805 SF Storage Warehouse	Y	$3,700,000
Crittendon, Ivory & Billie R.	420171046	1948- UNK SF 2 story IND	Y	$1,000,000
Khara Realty 4 LLC	420174058	1935- 896 SF Residential, 1935- 628 SF Residential	Y	$630,000
Curtis, Aubyn	420175012		N	$521,000
Scott, Watler & Florence	420171014	1936- 820 SF Residential	Y	$620,000
Carpenter, J Brook & Kathleen	420171039	1930- 1,795 SF Residential, 1955- 1,056 SF Barn, 1955- 528 SF Detached garage	Y	$940,000
In Trust for USA	420174041	1936- 1,098 SF Residential	Y	$550,000
Hodges Land Development LLC	420174004		N	$258,000
8311 Ewood LLC	420174047	1985- 600 SF Office Building. 2000- 1,740 SF Storage-material	Y	$1,100,000
Craig, Scott & Kathy	420174044	1973- 1,768 SF Residential, 1961- 576 SF Detached Garage	UNK	$820,000
UNK	UNK		N	$67,000
Cabot IV - WA1L01 LLC	420174701		N	$371,000
Cabot IV - WA1L01 LLC	420174708	2015- 170,592 SF Storage Warehouse	UNK	$19,700,000
Olson, Larry	420174036	1955- 1,296 SF 1 1/2 story Fin residential, 1992- 3,888 SF Detached Garage	Y	$791,000
Nazir, Muhammad Khalid	420174021	1958- 1,060 SF Residential	Y	$711,000
IAC Port 167 LLC	6026520010	2016- 399,511 SF Mega Warehouse	Y	$45,700,000
IAC Port 167 LLC	6026520020	2014- 253,605 SF Mega Warehouse	UNK	$1,950,000
UNK	6026520030		UNK	$67,000
IAV VABP LLC	0420212071 0420212070 0420212069	Storm Water Pond	N	$1,950,000
Total				$176,746,000

Notes: UNK = Unknown data at this time. Additional research would be required if acquisition were to proceed.

609 Property Acquisition Plan Summary for Alignment Shift Option South and West of 6020 8th Street
610 E

OWNER	TAX PARCEL	Improvements	Relocation	Total Parcel Cost
Portland At St Paul LLC	320011106		Y	$186,000
Portland At St Paul LLC	320011104	1950- 3,869 SF Office Building	Y	$1,353,000
Portland At St Paul LLC	320011105	1960- 10,400 SF Light Industrial Shell Buildings	Y	$1,103,000
Portland At St Paul LLC	320011052	1960- 10,530 SF Light Industrial Shell Buildings	Y	$1,159,000
Stryder LLC	320011053	1981- 9,821 SF Storage Warehouse	Y	$1,460,000
Stryder LLC	320011033	1972- 2,000 SF Storage Warehouse, 1979- 1,720 SF Storage Warehouse	Y	$1,460,000
Lupp Properties LLC	320011035	1972- 11,735 SF Storage Warehouse	Y	$1,407,000
Port of Tacoma	320011034	1993- 8,000 SF Light Industrial Shell Buildings, 1978- 5,000 SF Light Industrial Shell Buildings	Y	$1,845,000
Atlas Real Estate LLC	320011036		N	$573,000
Iselin, Jerald D & Luann D	320015000	1980- 1,434 SF Office Building	Y	$645,000
Iselin, Jerald D & Luann D	320015003		N	$204,000
UNK	UNK		N	$95,000
Marilyn J Weber & Patricia J Weber	420062089	1950- UNK SFAddon	Y	$531,000
USA In Trust for	420062166		N	$381,000
Odom Corporation	0420066001 04200660044	2001- 104450 SF Masonry industrial	N	$20,532,000
Wittenberg Herbet LLC	4200660022		N	$20,533,000
Alchemy Group	420066003	2000- 20,025 SF Industrial Engineering & Research	Y	$5,507,000
Milgard Manufacturing Inc	320014086	1978- 79,790 SF Indust Light Manufacturing	Y	$15,423,000
Milgard Manufacturing Inc	420063105	1997- 151,124 SF Light Industrial Shell Buildings	Y	$13,140,000
Milgard Manufacturing Inc	420063009		Y	$3,533,000
Milgard Manufacturing Inc	420063061		Y	$770,000
Milgard Manufacturing Inc	420063092	2001- 166,860 SF Light Ind Shell Buildings	Y	$14,977,000
Milgard Manufacturing Inc	420063093		Y	$619,000
Lee & Jane Simon	0420063118	None	N	$1,265,000
Bridgeview Enterprises LLC	420067033		Y	$444,000
Bridgeview Enterprises LLC	420067032	2005- 14,060 SF Storage Warehouse, 2014- 576 SF Shed-equipment	Y	$2,860,000
12th St E Development LLC	420067020	2000- 39206 SF Masonry Office PARKING	N	$7,195,000
Total				$119,200,000

611 Attachment E – Section 106 Area of Potential Effect



612

613 Source: Figure A.1 from WSDOT 2015

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Attachment F – Correspondence with the State Historic Preservation Officer

(correspondence included on following pages)

Washington State Department of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

September 28, 2016

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology & Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Log: 080700-51-FHWA
RE: SR 167 Extension Project, Puyallup to SR 509 – New Freeway
Cultural Resources Survey Report to Support NEPA Re-Evaluation

Dear Dr. Brooks:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the SR 167 Extension Project to address transportation needs in Pierce County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We are inviting your review of a recent cultural resources survey report prepared to ensure compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800 as the project proceeds.

SR 167 is the primary freeway connecting the Kent and Puyallup River valleys to the Seattle/Tacoma/Bellevue metropolitan area. The original planned route for the highway ran from Renton to Tacoma, but construction halted near Puyallup in the 1980s before the freeway could be completed to Tacoma. WSDOT is designing a highway completion from the existing SR 167 that is expected to improve safety, reduce congestion, and improve mobility along local roads and freeways in the surrounding area. This new six-mile highway segment would provide two general purpose lanes in each direction from SR 161 (Meridian Avenue) in Puyallup to SR 509 at the Port of Tacoma Road. The project would also include a transit/carpool lane in each direction from I-5 to Puyallup. When completed, the facility would be a divided highway, with access points at interchanges in key locations: SR 509, 54th Avenue, I-5, Valley Avenue East and SR 161.

FHWA approved the Tier I Environmental Impact Statement (EIS), identifying a preferred route for the highway, in 1999. WSDOT began further study of the selected corridor in spring of 1999 with the Tier II EIS. FHWA published the Tier II Final EIS, outlining plans to avoid or lessen the project's potential environmental impacts, in December 2006. FHWA issued a Record of Decision in October 2007, allowing WSDOT to proceed with advanced engineering and design work. Right-of-way acquisition and engineering is proceeding as funding allows.

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The engineering and design work completed since 2007 has resulted in revisions to the proposed SR 167 alignment. WSDOT revised the project Area of Potential Effects (APE) accordingly, and transmitted the revised APE to your office in August 2015. Archaeological and Historical Services (AHS) has conducted additional cultural resources survey and evaluation of the revised APE as described in the enclosed report. The main purpose of this cultural resources survey was to compare impacts documented in the original Tier II FEIS alignment with impacts resulting from WSDOT's proposed refined alignment.

The recent cultural resource investigations did not result in the discovery of any previously unrecorded archaeological sites. Shovel testing in the vicinity of site 45PI488 resulted in shifting the site boundary approximately 10 meters north to include locations where additional fire-modified rock was identified. WSDOT continues to plan to avoid archaeological site 45PI488 by spanning it with an overhead structure, as documented in the original project MOA signed in 2006.

As described in the enclosed report, archaeological survey could not be completed in some parcels due to field conditions or lack of landowner access permission. Cultural resource investigations will occur in these parcels prior to project construction as stipulated in the amended MOA signed in 2013.

Sixty-five properties over 45 years of age were recorded during the built environment survey conducted to identify and record buildings/structures not addressed during the original FEIS phase, or that have reached the 45-year threshold in the interim. Applying criteria developed by the National Park Service, it was determined that six properties of the 65 properties recorded are eligible for listing in the NRHP based upon the integrity of their architecture, historic appearance, and original construction materials. WSDOT anticipates that three of the six historic properties will be adversely affected by the project. The houses at 6020 8th Street E and 4403 Freeman Road E are in the direct footprint of the refined alignment and will need to be removed, and the house at 6007 Milwaukee Avenue E is just outside the direct footprint and will either be removed or have a noise wall constructed on the property.

We invite your review of the cultural resources report and our historic property determinations. We look forward to future consultation as we work to amend the project MOA to resolve adverse effects to these three properties. If you have questions or comments regarding the proposed project, you may contact me by phone at 360-570-6638, or by email at kiersro@wsdot.wa.gov.

Sincerely,



Roger Kiers
WSDOT Archaeologist

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Enclosures: *Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project - Puyallup to SR 509, Pierce County, Washington*, prepared by AHS, December 2015 (via WISAARD)

cc: Jeff Sawyer, WSDOT Olympic Region EHS
Dean Moberg, FHWA Area Engineer

623

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

October 6, 2016

Roger Kiers
WA State Dept. of Transportation
P.O. Box 47332
Olympia, WA. 98512-7332

In future correspondence please refer to:
Project Tracking Code: 080700-51-FHWA
Property: SR 167, Puyallup to SR 509
Re: ADVERSE Effect

Dear Mr. Kiers:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation regarding the above referenced project. We have reviewed the materials you have provided for this project. First, we concur that the proposed project shall continue to avoid Site 45PI488, as stipulated in the 2006 Memorandum of Agreement (MOA). We have also reviewed the 65 properties identified during your built environment survey. We also concur with your determination that the following five properties are eligible for inclusion in the National Register of Historic Places under Criterion C:

- 6020 8th St. E, Fife, WA.
- 411 Birch St., Milton, WA.
- 4403 Freeman Rd. E, Puyallup, WA.
- 6007 Milwaukee Ave E, Puyallup, WA.
- 6020 Milwaukee Ave E, Puyallup, WA.

We also concur with your determination that the property located at 860 64th Ave E, Fife, WA. (Joe Young Cabin) is eligible for inclusion in the National Register of Historic Places under Criterions A and C. Finally, we concur with your determination that the project as proposed will have an Adverse Effect on the properties located at 6020 8th St. E, Fife, 4403 Freeman Rd. E, and 6007 Milwaukee Ave E.

In view of our concurrence on the adverse effect determination, we look forward to further consultation and the development of an amended MOA. The amended MOA shall identify specific measures that when implemented will serve to mitigate the adverse effect on the properties.

Also, we appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the SHPO pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

State of Washington • **Department of Archaeology & Historic Preservation**
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov

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Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,



Dennis Wardlaw
Transportation Archaeologist
(360) 586-3085
dennis.wardlaw@dahp.wa.gov

State of Washington • **Department of Archaeology & Historic Preservation**
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov

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Washington State Department of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300
360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

March 1, 2018

Allyson Brooks, Ph.D.
State Historic Preservation Officer
Department of Archaeology & Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Log: 080700-51-FHWA
RE: SR 167 Extension Project, Puyallup to SR 509 – New Freeway
Cultural Resources Survey Report to Support NEPA Re-Evaluation

Dear Dr. Brooks:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the SR 167 Extension Project to address transportation needs in Pierce County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, we are continuing formal Section 106 consultation pursuant to 36 CFR § 800.2(c)(4), under delegated authority from FHWA. We are inviting your review of a recent cultural resources survey report prepared to ensure compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800 as the project proceeds.

FHWA approved the Tier I Environmental Impact Statement (EIS), identifying a preferred route for the highway, in 1999. WSDOT began further study of the selected corridor in spring of 1999 with the Tier II EIS. FHWA published the Tier II Final EIS, outlining plans to avoid or lessen the project's potential environmental impacts, in December 2006. FHWA approved the Tier II FEIS by signing the Record of Decision in October 2007, allowing WSDOT to continue with right-of-way acquisition, and advanced engineering as funding allowed. Design work completed since 2007 resulted in revisions to the SR 167 alignment to further reduce environmental impacts, complexity, and right-of-way and construction costs. WSDOT revised the project Area of Potential Effects (APE) accordingly, and transmitted the revised APE to the SHPO in August 2015.

Funding authorized by the 2015 "Connecting Washington" legislation was less than required to construct the full Build Alternative described in the 2006 FEIS. Therefore, in accordance with legislative proviso, WSDOT conducted a series of Steering and Executive Committee stakeholder meetings in 2016 and 2017 in order to reach consensus with stakeholders on a reduced SR 167 project scope and design features. The outcome of this stakeholder collaboration was a new proposed SR 167 "Phase 1 Improvements" which is somewhat smaller in scope than the preferred Build Alternative described in the 2006 FEIS. These

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Phase 1 Improvements will complete the SR 167 freeway by building four miles of a new facility from its current terminus in Puyallup at SR 161, through the Puyallup River Valley and connecting to Interstate 5 (I-5) near the 70th Avenue crossing. The project also includes a new, two-mile highway section from SR 509 near the Port of Tacoma to I-5 and SR 167 at the interchange near 70th Avenue. The new limited-access freeway segments will have interchanges at SR 161 (Meridian), Valley Avenue, I-5, 54th Avenue East, and SR 509.

The APE for the Phase 1 Improvements is the same as what was provided to the SHPO in 2015. Archaeological and Historical Services (AHS) conducted additional cultural resources survey and further evaluation of the APE in the fall of 2017, as described in the enclosed report. AHS completed field survey of 6.7 acres and excavation of a total of 36 shovel tests in portions of the Phase 1 right-of-way not accessed for survey in 2015. Unfortunately, the recent archaeological survey could not be completed on all the remaining parcels due to field conditions or lack of permissions. Cultural resource investigations will occur on these parcels prior to project construction, as stipulated in the amended Memorandum of Agreement (MOA) signed in 2013.

The 2017 investigation did not result in discovery of any previously unrecorded archaeological sites. WSDOT will continue to avoid archaeological site 45PI488, as documented in the original project MOA signed in 2006. No buildings or structures in the 2017 (6.7 acre) survey area crossed the 45-year-old threshold since the 2015 investigations, and no additional structures were recorded in 2017. Of the six extant NRHP-eligible historic properties identified in the SR 167 Project APE during previous cultural resources investigations, three remain within the proposed Phase 1 right-of-way, and WSDOT anticipates that two will be adversely affected by the project. The houses at 6020 8th Street E and 4403 Freeman Road E remain in the direct footprint of the Phase 1 alignment and will need to be removed.

A third house, at 6007 Milwaukee Avenue E, is outside the direct footprint, but WSDOT previously anticipated that the house would either need to be removed or have a noise wall constructed on the property. A recent change in the preliminary design for the Phase 1 Improvements indicates that the parcel will not need to be acquired by WSDOT, and therefore the house will not be removed or otherwise directly impacted. Proposed work in the vicinity of the house may include a noise wall and retaining wall up to 16 feet high, which would be constructed along the southern edge of the existing SR 167 right-of-way. Given the previously compromised integrity of setting and the fact that the house is eligible for its design, we have determined that these indirect effects will not be adverse. This reverses our previous determination of adverse effect made in our letter of September 28, 2016, when we believed the house would be directly affected.

We invite your review of the cultural resources report and our effect determinations. WSDOT is proposing DAHP Level II documentation as mitigation for the loss of the two eligible historic properties at 6020 8th Street E and 4403 Freeman Road E. This commitment would be memorialized in an amended project MOA. We look forward to future consultation to amend the project MOA and resolve adverse effects to these properties.

If you have questions or comments regarding the proposed project, you may contact me by phone at 360-570-6638, or by email at kiersro@wsdot.wa.gov.

Sincerely,

Roger Kiers
WSDOT Archaeologist

Enclosures: *Cultural Resources Investigations to Support NEPA Re-Evaluation of the Washington State Department of Transportation's SR 167 Extension Project - Puyallup to SR 509, Pierce County, Washington*, prepared by AHS, December 2017 (via WISAARD)

cc: Jeff Sawyer, WSDOT Olympic Region EHS
Dave Davies, WSDOT SR 167 Completion Project
Dean Moberg, FHWA Area Engineer

dahp

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 8, 2018

Mr. Roger Kiers
WA State Dept. of Transportation
P.O. Box 47332
Olympia, WA. 98512-7332

In future correspondence please refer to:
Project Tracking Code: 080700-51-FHWA
Property: SR 167, Puyallup to SR 509
Re: More Information Needed

Dear Mr. Kiers:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. In response, we have reviewed the materials you provided for this project. First, concur with the results of the subsurface testing portion of the supplemental report. However, we have concerns regarding the property located at 6007 Milwaukee Ave E (Property #680539). Current depiction on Figure 5 in the report shows the property to be within the Project ROW. We are requesting more information on proposed work in the vicinity of this property. Additionally, we are requesting information on the potential sound or retaining wall as the Built Environment staff have concerned about potential indirect effects.

We appreciate receiving copies of any correspondence or comments from concerned tribes and other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the SHPO pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Dennis Wardlaw
Transportation Archaeologist
(360) 586-3085
dennis.wardlaw@dahp.wa.gov

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310 Maple Park Avenue S.E.
P.O. Box 47300
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360-705-7000
TTY: 1-800-833-6388
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March 8, 2018

Mr. Dennis Wardlaw
Transportation Archaeologist
Department of Archaeology & Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Log: 080700-51-FHWA
RE: SR 167 Extension Project, Puyallup to SR 509 – New Freeway
Response to Request for More Information

Dear Mr. Wardlaw:

The Washington State Department of Transportation (WSDOT), in cooperation with the Federal Highway Administration (FHWA), is continuing to develop the SR 167 Extension Project to address transportation needs in Pierce County. In order to ensure that WSDOT takes into account the effects of this undertaking on properties listed in or eligible for listing in the National Register of Historic Places, we are continuing formal Section 106 consultation under delegated authority from FHWA. I am responding to your request for more information regarding project effects in the vicinity of the historic property at 6007 Milwaukee Ave E.

As you pointed out in your letter dated March 8, 2018, the property at 6007 Milwaukee Ave E is shown within the Project ROW on Figure 5 of the most recent cultural resources report. As noted in our letter dated March 1, 2018, the property is in fact now outside the Project ROW due to recent design changes, and the property will no longer need to be acquired. Instead, a retaining wall and potential noise wall would be constructed along the edge of existing ROW adjacent to the property. An exhibit depicting the current project design in this area is enclosed for your reference, showing proposed improvements around the curve from the northbound SR 167 off-ramp to southbound SR 512 (6007 Milwaukee Ave E is labeled "P887" on the exhibit). As previously noted, the retaining/noise wall, if needed, would be 16 feet high.

If you have further questions or comments regarding the proposed project, please feel free to contact me.

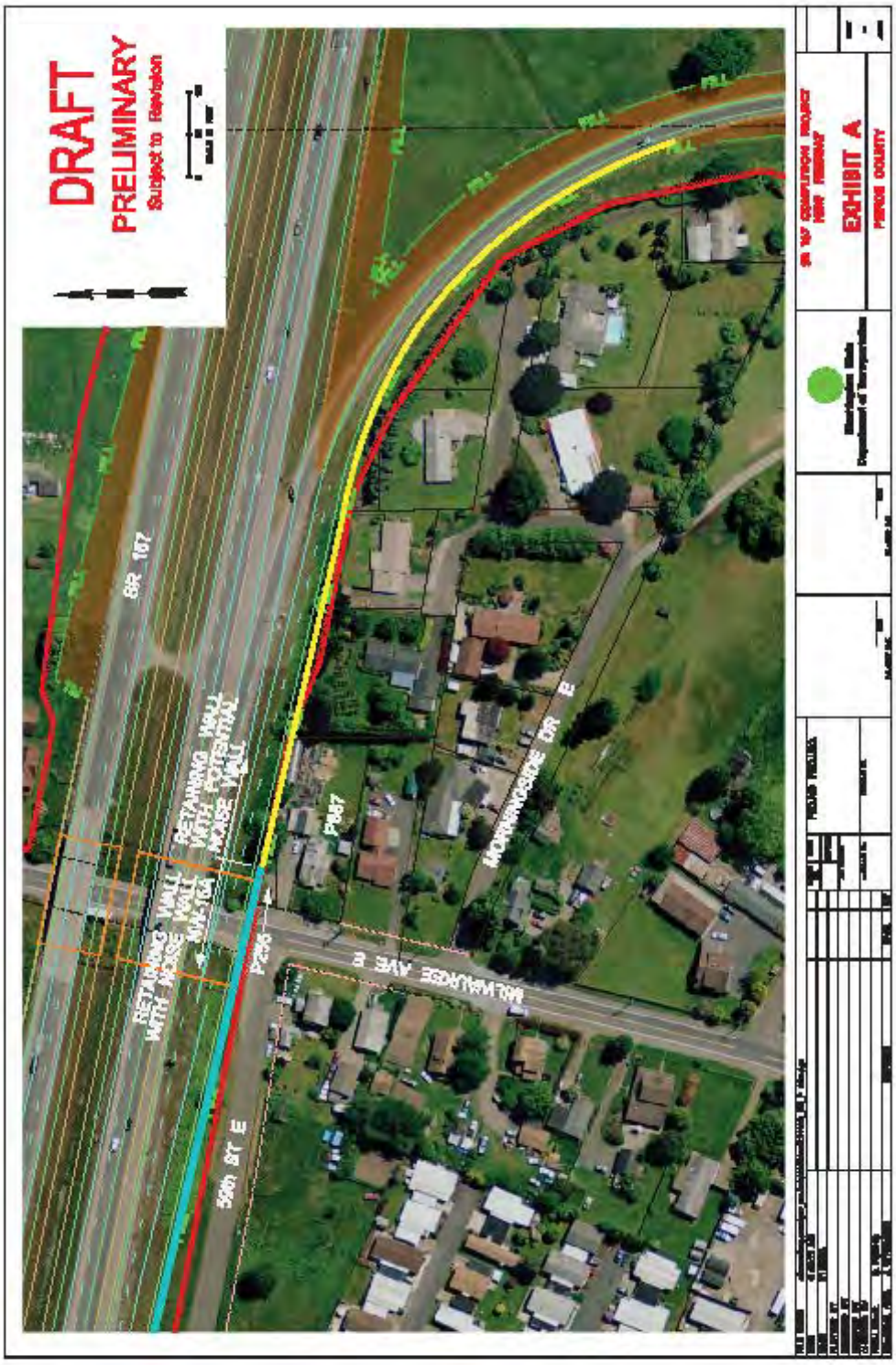
Sincerely,

Roger Kiers
WSDOT Archaeologist

Enclosures: "Exhibit A"

cc: Dave Davies, WSDOT SR 167 Completion Project

630


DRAFT
PRELIMINARY
Subject to Revision
SR 167
RETAINING WALL WITH POTENTIAL NOISE WALL
RETAINING WALL WITH NOISE WALL
MILWAUKEE AVE E
MORNINGSIDE DR E
59th ST E
EXHIBIT A
PIERCE COUNTY

631
632

dahp

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 14, 2018

Mr. Roger Kiers
WA State Dept. of Transportation
P.O. Box 47332
Olympia, WA. 98512-7332

In future correspondence please refer to:
Project Tracking Code: 080700-51-FHWA
Property: SR 167, Puyallup to SR 509
Re: ADVERSE Effect

Dear Mr. Kiers:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. We have reviewed the materials you provided for this project. As a result of our review, we concur with your determination that the project as proposed will have an Adverse Effect on a property listed in, or eligible for listing in, the National Register of Historic Places.

In view of our concurrence on the adverse effect determination, we look forward to further consultation and the development of an amended Memorandum of Agreement (MOA). The amended MOA shall identify specific measures that when implemented will serve to mitigate the adverse effect on the property.

Also, we appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4). These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Dennis Wardlaw
Transportation Archaeologist
(360) 586-3085
dennis.wardlaw@dahp.wa.gov

State of Washington • **Department of Archaeology & Historic Preservation**
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov

633
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From: Wardlaw, Dennis (DAHP) <dennis.wardlaw@dahp.wa.gov>
Sent: Monday, September 10, 2018 3:40 PM
To: Kiers, Roger <KiersRo@wsdot.wa.gov>
Subject: RE: Request for clarification regarding 3/14/18 letter from DAHP

Hi Roger,

To clarify the properties are: 6020 8th Street E, and 4403 Freeman Road E, and 6007 Milwaukee Ave E

Regards,
Dennis

From: Kiers, Roger <KiersRo@wsdot.wa.gov>
Sent: Monday, September 10, 2018 2:48 PM
To: Wardlaw, Dennis (DAHP) <dennis.wardlaw@dahp.wa.gov>
Subject: Request for clarification regarding 3/14/18 letter from DAHP

Dear Dennis –
For purposes of clarification, could you please respond to this email confirming that the adverse effect referred to in your letter dated March 14, 2018 (attached) is for the properties at 6007 Milwaukee Ave E, 6020 8th Street E, and 4403 Freeman Road E?
Thank you,

Roger Kiers
Cultural Resources Specialist - Archaeologist
WSDOT Environmental Services Office
PO Box 47332, Olympia, WA 98504-7332
Office: 360-570-6638
Cell: 360-485-7255
Work schedule: M-Th 7:30-5:00, Fri 7:30-4:00 (off biweekly)

AMENDMENT TO THE MEMORANDUM OF AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION, US ARMY CORPS OF ENGINEERS, AND THE WASHINGTON STATE HISTORIC PRESERVATION OFFICER PURSUANT TO 36 CFR Part 800.6(a) REGARDING THE SR 167 PUYALLUP TO SR 509 PROJECT, PIERCE COUNTY, WASHINGTON

WHEREAS, the original Agreement was executed in November 2006 and amended in December 2009 and May 2013;

WHEREAS, the undertaking's design has been modified since the amended agreement was signed in 2013, and the project will have an adverse effect upon three additional properties determined eligible for inclusion in the National Register of Historic Places (NRHP), thus warranting this amended agreement; and

WHEREAS, the Federal Highway Administration (FHWA) has notified the Advisory Council on Historic Preservation (ACHP) and will send a copy of this executed amendment to the ACHP;

NOW, THEREFORE, in accordance with Stipulation 7 of the original Agreement, FHWA, the United States Army Corps of Engineers Seattle District (COE), and the Washington State Historic Preservation Officer (SHPO) agree to amend the Agreement to include the following Stipulations:

STIPULATIONS

FHWA will ensure that the following measures are carried out:

1. Historic Property Documentation:
WSDOT will complete documentation of the historic properties at 4403 Freeman Rd. E, 6007 Milwaukee Ave. E, and 6020 8th St. E, to Department of Archaeology and Historic Preservation (DAHP) Level 2 standards. For the properties at 4403 Freeman Rd. E and 6020 8th St. E, WSDOT will record the interiors in addition to the exteriors.

2. Historic Structure Salvage:
The buildings at 4403 Freeman Rd. E and 6020 8th St. E will be demolished after materials have been salvaged for potential re-use, unless no materials are identified by a building materials salvage company willing to remove materials from the structures. WSDOT will provide DAHP with documentation of contacts made with salvage companies prior to demolishing the structures.

3. Online Documentation and WISAARD Enhancement:
WSDOT will coordinate with DAHP to place the documentation produced under Stipulation 1 online on the Washington Information System for Architectural and Archaeological Records Data (WISAARD), and to provide funds not to exceed $50,000 to assist DAHP with integrating the administrative database into WISAARD project links.

SIGNATORY PARTY

Federal Highway Administration

By: Daniel Mathis Date: 08/22/2018
Daniel Mathis
Division Administrator

Note: Signatures continued on next page.

SIGNATORY PARTY

U.S. Army Corps of Engineers, Seattle District

By: _____ Date: 8/20/18
for Colonel Mark A. Geraldi
Seattle District Commander and District Engineer

Note: Signatures continued on next page.

SIGNATORY PARTY

Washington State Department of Archaeology and Historic Preservation

By: _____ Date: 8/20/18

Allyson Brooks, Ph.D.
State Historic Preservation Officer

Note: Signatures continued on next page.

INVITED SIGNATORY

Washington State Department of Transportation

By:_____ Date: 9-20-2018
Craig J. Stone, P.E.
Puget Sound Gateway Program Administrator

Note: End of signature pages.

PUGET SOUND GATEWAY PROGRAM – PHASE 1 OF THE SR 167 COMPLETION PROJECT

NEPA Re-Evaluation Public Comment Summary

Prepared for

Federal Highway Administration
Washington State Department of Transportation

Prepared by

SR 167 Project Team

March 2019

Re-Evaluation Comments and Responses

Comment:

I have some questions regarding fill location off of Levey Rd.

Response:

WSDOT responded via personal phone call to address these questions.

Comment:

How many times will you delay and redefine this project? I've seen overpasses carpool lots and interchanges added, removed and redesigned with every version of this project. What is this Version 3.2.1 numbers running off that never end. When the Gas Tax funding passed at least 8 years ago we had a timeline to start construction 2010 the intersection at Meridian to our relief would be starting soon. Now again it's been redefined like Lucy grabbing the "T"'d up football again! The Piece of this project that needs to be completed is Meridian to Valley we have 2 freight companies FedEx and UPS relocated to Valley Ave. with SR-167 traffic volume at 35 MPH. On Fridays the traffic has backup in the south turn lane from Meridian past the location of the new Valley intersection in Fife but still no relief until 2035? In this latest Version changes to scale down and streamline I agree it should have started here now put the shovel to the ground starting at Meridian and work North!

Response:

Thank you for your comment. The SR 167 Completion Project will build the last segment of State Route 167, which has been planned since the late 1950s, so your concern about delay is understandable. The Puget Sound Gateway Program, which is comprised of both the SR 167 Completion Project and the SR 509 Completion Project, received funding from the Washington State Legislature for environmental studies, preliminary design, and right of way in previous funding packages in 1991, 2003 and 2005. It was not until the 2015 Connecting Washington transportation package that the Legislature provided funding for construction. Since Connecting Washington funding comes from the gas tax, funding is provided over a 16-year timeline as the gas tax revenue is generated. The Stage 1 portion of the project will build the highway from SR 509 to Interstate 5 to serve the trips to the Port of Tacoma and the Tideflats area, supporting economic growth. This work will begin in 2019 and be complete by 2026. The Stage 2 portion of the project will build the highway between Puyallup and I-5 and our current schedule shows this work beginning in 2026 and being completed by 2030. However, the Legislature directed WSDOT to explore the possibility of compressing the delivery schedule for both the SR 509 and SR 167 projects and we recently submitted a *Benefits of Program Acceleration* report to them for consideration. If the Legislature takes action to accelerate the schedule, Stage 2 could be delivered up to three years earlier.

Regarding the intersection at Meridian and Valley Avenue, our traffic modeling shows that, once Stage 2 of the SR 167 Completion Project is completed, the intersection will experience improved traffic flow.

Comment:

Hello, I am very much a fan of the current plans with SR 167 that you have posted here. However, I do not support having all lanes of the new highway being tolled. I believe only half should be.

Thank you for taking the time to read my comment.

Response:

Thank you for your comment. Tolling all lanes of the new highway is necessary for a few different reasons. The 2015 Connecting Washington revenue package provided the majority of the funds for the Puget Sound Gateway Program from the gas tax, however the state Legislature intended for a portion of the overall funding to come from toll revenue. Tolling on SR 167 is expected to raise a portion (approximately $95 million) of the total estimated $1 billion needed to construct the project.

In addition to generating revenue to help pay for the project, WSDOT needs to toll SR 167 and SR 509 to manage traffic. Without tolling, WSDOT will not be able to manage traffic flow where these corridors connect to I-5. Traffic forecasting shows that both SR 167 and SR 509 would become extremely congested without tolling. Tolling half the lanes also would not raise the revenue necessary to meet the legislative intent to raise $95 million from tolling.

Toll revenue will be used to pay for maintenance, operations, and could be used for future improvements on this segment of the SR 167 corridor.

Comment:

I am an urban planner living in the Tacoma area, and frequently study parcels in the Sumner and Puyallup valleys. I use the 167 corridor to reach these areas from Tacoma. I would like to encourage WSDOT to design left turns to permit flashing yellow arrows. For example, the left turn from SR-99 to the new bridge over I-5, as well as the left turn onto southbound 167 from Valley Ave (if there are plans to signalize that movement at all). I would also like to encourage WSDOT to make the Stage 1 off-ramp from southbound I-5 to northbound 167 a double left turn. The graphics suggest that there will only be one left turn lane for this important movement. It may also be wise to adjust the route number for the extension of 167 between SR-161 and I-5, since the cardinal directions will be the opposite of the actual direction. Thank you for your time.

Response:

Thank you for these suggestions. WSDOT is currently in the process of designing all five interchanges to determine the optimal geometric configuration of these interchanges. The current design for the I-5/SR 167 interchange is a Diverging Diamond, which is more efficient and safer than traditional designs. There are over 60 of these interchanges across the nation, and the first one in Washington State is currently being constructed on I-5 in Lacey (https://www.youtube.com/watch?v=5gLxlXamhgY&feature=youtu.be). With a Diverging Diamond design, southbound I-5 to northbound SR 167 is controlled by a traffic signal, but it is very efficient because the signal does not have a separate phase (cycle) for left turns. In addition, we are in the process of comparing traffic operations of signals and roundabouts at several intersections along the corridor. To minimize driver confusion the signing for the new segment of highway will match the existing signing along the remainder of SR 167.

Comment:

NO MORE TOLLS !!! thank you

Response:

Thank you for your comment. The Washington State Legislature's intent is that toll revenue from this facility be used to pay back bonds for construction, to maintain and operate the facility, and to manage traffic to provide reliable speeds. While the Washington state gas tax still provides most of this project's funding, revenue from gas tax is falling due to increases in electric vehicles and fuel-efficient hybrids, causing the Legislature to look for alternative funding mechanisms. Additionally, current revenue from the gas tax is primarily used to pay back bonds for completed projects. Without tolls, the SR 167 project could not be constructed based on current federal and state gas taxes.

Comment:

I can't wait. Build it now. Sorry to see the loss of HOV lanes but the priority is to build ASAP.

Response:

Thank you for your comment. The construction timeline for this project is constrained by the funding schedule put forth in the 2015 Connecting Washington revenue package. The project is currently on an 11-year design and construction timeline. However, the Washington State Legislature directed WSDOT to explore the possibility of compressing the delivery schedule for both the SR 509 and SR 167 projects and we recently submitted a *Benefits of Program Acceleration* report to them for consideration. If the Legislature takes action to accelerate the schedule, Stage 2 could be delivered up to three years earlier. The HOV lanes are not included because there was insufficient funding to build three lanes in each direction at this time. Our modeling shows that tolling on the facility will manage traffic and help provide reliable speeds.

Comment:

This is explained as “improvements”, however it appears to be a large scale-back from the initial plan...plus new tolling. I am extremely opposed to this new scaled-down plan, and even more extremely opposed to the tolling addition.

Living in Tacoma for the last 20 years, I have been in the thick of the terrible traffic (I5) that has been occurring because an original road plan was not built to factor in growth in the first place. This new revised plan for 167 is taking away all of the room for expected growth in the south sound. We have sat through enough construction traffic on hwy 16/I5 and I do not wish to do the same thing on 167 in 10 years because it was not built to accommodate growth. Please, keep the original number of lanes with HOV lanes and NO TOLLING!!!!! Get it done right the first time!

Response:

Thank you for your comments. When the SR 167 Completion Project started acquiring property for the future highway in 2000, we acquired enough property to build three lanes in each direction. While the plans for Phase 1 have been reduced to two lanes in each direction, this right of way acquisition makes it possible to potentially widen the highway in the future, if additional funding is obtained. That being said, one of the main benefits of tolling this new segment of highway is that tolling will be used to “manage” the traffic volume using the highway. If volumes are getting too high and starting to cause unreasonable congestion, the toll rate can be increased during those peak hours to decrease volumes and ease congestion. This management tool is intended to minimize the need for future expansion.

The Phase 2 elements of HOV lanes and additional interchange ramps would double the cost of the project, for which there is no funding. The decision to reduce the project to two lanes in each direction for Phase 1 was the result of WSDOT's Practical Solutions process, wherein local stakeholders helped define the most critical elements of the project to use the funding provided by the Legislature most efficiently.

We understand that congestion and ongoing construction are issues on Interstate 5 through Tacoma and Fife. The Legislature made a significant investment in that corridor, and building those improvements while maintaining reliability for 200,000 cars per day has been challenging. The good news is that we are just beginning the last project as part of this HOV program which will build the new southbound I-5 Puyallup River Bridge.

Tolls are needed on this facility to pay back bonds for construction, maintain and operate the facility, and manage traffic to help provide reliable speeds. While the Washington state gas tax still provides most of this project’s funding, new fuel standards are reducing revenue, causing the Legislature to look for alternative funding mechanisms. Additionally, current revenue from the gas tax is primarily used to pay back bonds for completed projects. Without tolls, the SR 167 project could not be constructed based on current federal and state gas taxes.

Comment:

Although I can appreciate the i5/167 connector, I think your recent study is extremely inaccurate. Your litterateur states 167 is a viable route between Puyallup and Kent. However, the main body of the freeway is vastly undersized. The new HOV lanes completed last year did nothing to relieve traffic congestion. Congestion was pushed further south into summer and Puyallup. Now, with an extension to bring traffic and commerce from i5 your want to add more traffic to 167? This is not sustainable. More and more people moving to south Puget sound and pierce county is choking 167 as it is. Now you want to add freight, semis, and more passenger vehicles?!? Aside from that, I doubt you've traversed meridian at the Puyallup river. It's a congested nightmare. And with this extension you want to make this a major on/off ramp area? WSDOT has proven themselves incapable of designing and engineering viable solutions to our congested traffic. With this extension planned to be completed in 2036 you really think 4 lanes (2 each way) will be a viable corridor from Puyallup to Tacoma? 167 as a 4 lane highway as it is can't sustain the vehicle traffic as it is. I don't think your survey and analysis thoroughly anticipated higher vehicle traffic 20 years from now. I would recommend a re-evaluation if the needs of the local Puyallup community, the needs of 167 as a whole, and the anticipated traffic 20 years from now. You are setting yourself up for another failure and total embarrassment.

Response:

Thank you for your comment. One purpose of the SR 167 Completion Project is to improve traffic flow by providing a reliable freight route that keeps trucks off local streets. The analysis WSDOT completed to assess the effects of the SR 167 Completion Project on traffic congestion, which extends to 2045 and assumes high growth in traffic volumes, shows improvements in traffic flow and reduced congestion. The Meridian interchange with SR 167 has been planned since the 1980s, and is anticipated in the City of Puyallup's Comprehensive Plan. In concert with other interchanges, the SR 167 Completion Project will improve congestion in the Puyallup area.

While the plans for Phase 1 have been reduced to two lanes in each direction, there is room for future widening of the highway under a Phase 2 if additional funding is obtained. The decision to reduce to two lanes in each direction was the result of WSDOT's Practical Solutions process, wherein local stakeholders helped define the most critical elements of the project to use the funding provided by the Legislature most efficiently.

In addition, there is $30 million funded under a separate project for WSDOT to add a HOV lane to northbound SR 167 from Puyallup to Pacific in 2021. There are plans for a southbound lane in this section, but it is unfunded at this time.

Comment:

I see no problems with the plan and have waited many years to see this happen. I just wish it could be done without tolling. We're paying for this with taxpayers' gas tax money along with the grants, and tolling just seems so unnecessary. When is the predicted end date for tolling?

Response:

Thank you for your comment. The Legislature is responsible for determining which roadways are tolled in Washington. Construction bonds can be as long as 30 years. Once the bonds have been paid a determination will need to be made whether to continue tolling to pay for operations and maintenance costs of the highway, to continue to manage traffic, and/or to add additional interchange ramps. Tolling is necessary on this project for a few different reasons. The 2015 Connecting Washington revenue package intended toll revenue to finance $95 million as part of the SR 167 Completion Project's funding plan. Tolling also will manage traffic volumes on the 24 lane miles of new roadway, which will help with speed reliability.

Comment:

Please end all tolls, 167, narrows bridge, 405, 99 tunnel, and the floating bridge. Find some other way to pay for your projects. I know that you keep collecting tolls long after the project have been paid for. End all Tolls.

Response:

Thank you for your comment. The 2015 Connecting Washington revenue package intended toll revenue as part of the SR 167 Completion Project's funding plan. Tolls are needed on this facility in order to pay back bonds for construction, maintain and operate the facility, and manage traffic to help provide reliable speeds. While the Washington state gas tax still provides most of this project's funding, new fuel standards are reducing revenue, causing the Legislature to look for alternative funding mechanisms. Additionally, current revenue from the gas tax is primarily used to pay back bonds for completed projects.

The Legislature is responsible for determining which roadways are tolled in Washington. For the last decade, the Legislature has directed WSDOT to use tolling to generate needed revenue for transportation improvements, and enhances mobility in some of state's most congested corridors. Toll revenues are used to fund capital investments and to cover ongoing operation and maintenance costs for toll facilities. Without tolls, many of these projects could not have been constructed based on current federal and state gas taxes.

As our region grows, tolling will continue to be a crucial tool in building a transportation system that can support the forecasted population and jobs growth, creating corridors where transit times are more reliable and providing drivers with choices for how to best manage their commutes.

SR 167 NEPA Re-Evaluation Online Open House Summary

February 21, 2019

Background

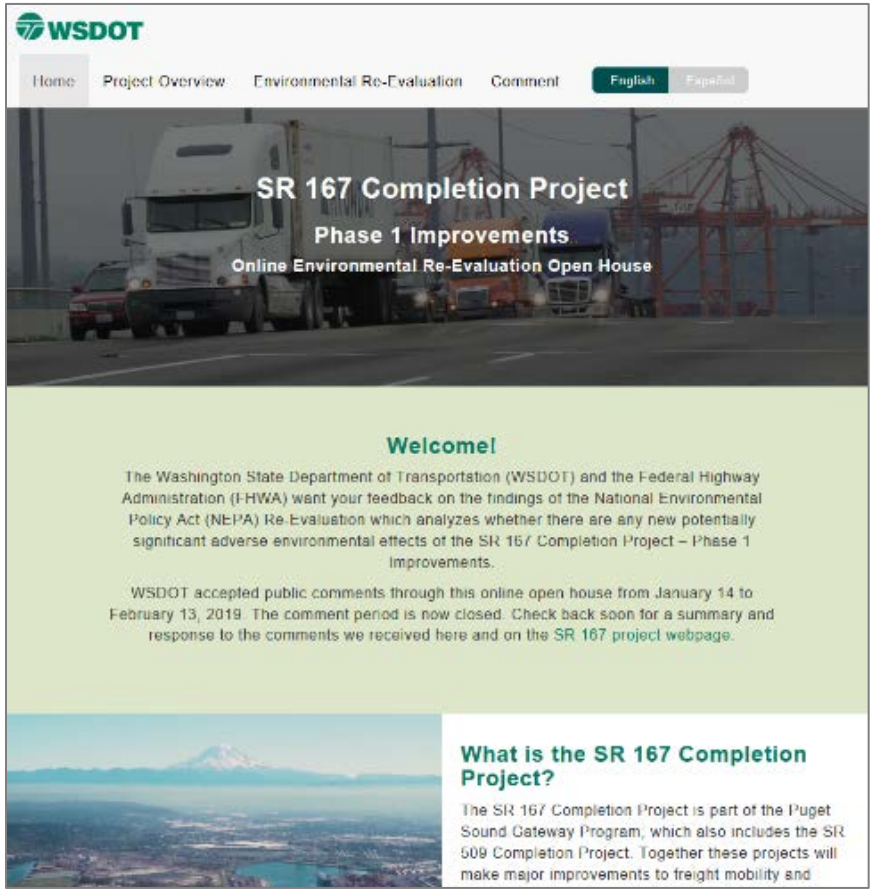
The Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA) completed a National Environmental Policy Act (NEPA) Re-Evaluation of the SR 167 Completion Project in late 2018. The Re-Evaluation analyzed whether there were any new potentially significant adverse environmental effects of the SR 167 Completion Project Phase 1 Improvements compared to the original 2006 Federal Environmental Impact Statement and 2007 Record of Decision.

WSDOT shared these findings, along with information about the Puget Sound Gateway Program which includes the SR 167 Completion Project through an online open house, launched on January 14, 2019. Community members were given the opportunity to comment on the Re-Evaluation through February 14, 2019. The website is still live, however the public comment feature has been disabled.

Site Content

All content on the site was available in English and Spanish. The online open house had four tabs highlighting different subject areas:

- Home/background
- Project overview
- Environmental Re-Evaluation findings



SR 167 NEPA Re-Evaluation Online Open House home page.

- Comment section

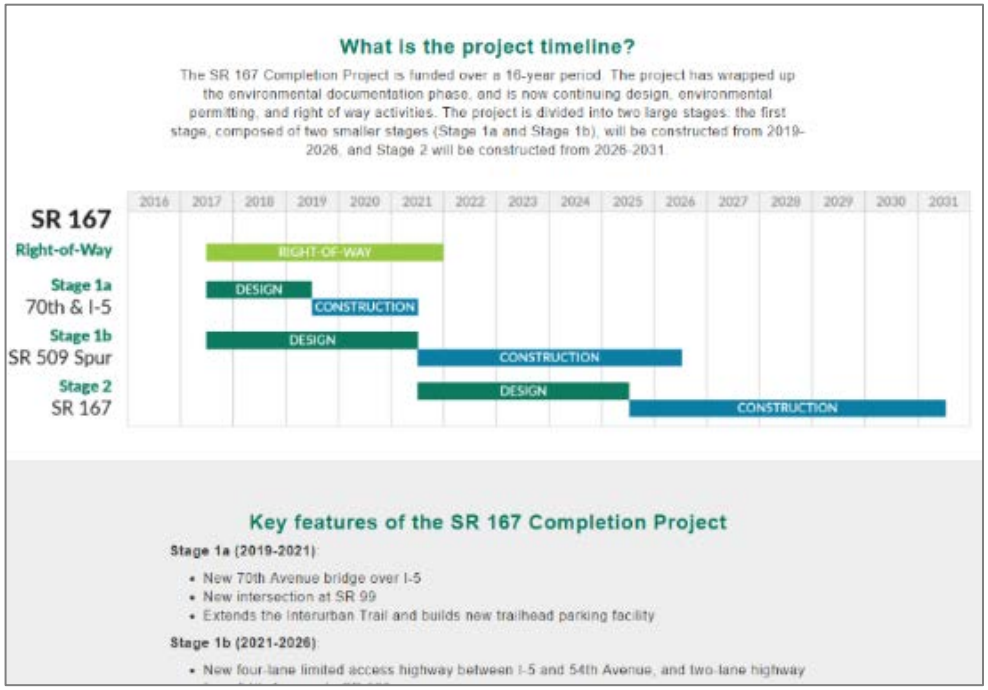
Home

Visitors first landed on the Home page, which summarized the Puget Sound Gateway Program and the SR 167 Completion Project at a high level and explained the purpose of the online open house.

Project Overview

The Project Overview page described the SR 167 Completion project in detail. It displayed a timeline for the right of way acquisition, design and construction of Stages 1 and 2, a vicinity map of the proposed alignment, and key project features.

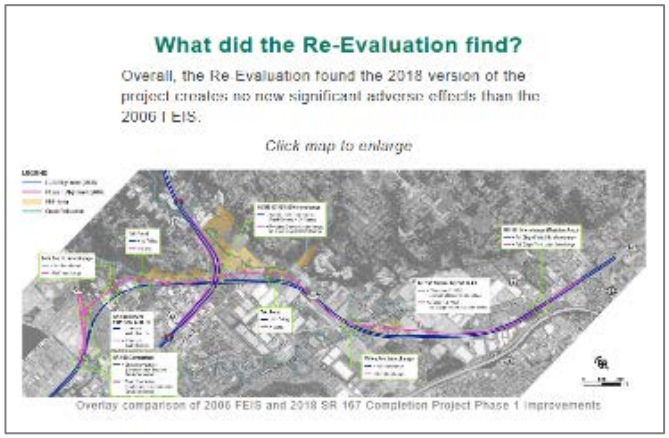
This page also highlighted the Riparian Restoration Program at Hylebos Creek, Surprise Lake Tributary and Wapato Creek. The page concluded with a brief discussion of funding sources and how tolling is intended to support the project.



The Project Overview page oriented visitors to the SR 167 Completion Project.

Environmental Re-Evaluation

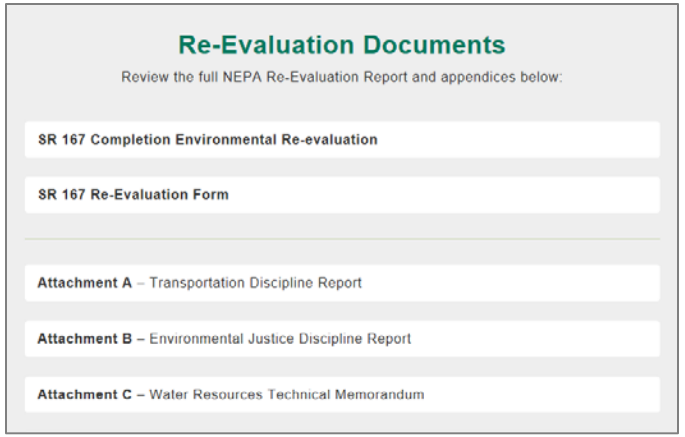
Next, the Environmental Re-Evaluation page explained the Re-Evaluation process and detailed the key findings. Maps, including an overlay comparison, displayed the differences between the 2006 Final Environmental Impact Statement (FEIS) Preferred Alternative and the 2018 Phase 1 Design. The page also included links to the NEPA Re-Evaluation report and appendices.



The Environmental Re-Evaluation page provided maps to compare Phase 1 Improvements with the 2006 FEIS.

Comment

The site invited visitors to take notes on each page as they navigated through the information presented. On the final Comment page, users compiled their notes in a form, where they could edit or include additional comments, and submit them for inclusion in this summary report. The last page also listed Chris Hoffman's email address for users to send additional comments or questions about the project, which remains on the site now that comment features have been disabled.



All SR 167 NEPA Re-Evaluation documents were available in PDF format on the online open house site.

Notification

By the numbers:

- Folios with an invitation to attend the open house were sent to 4,086 residents and businesses
- 2,392 individuals received an email via the SR 167 Project listserv
- 27 Steering Committee members received an email notification for the online open house
- 11 social service providers also received email notification
- Two Facebook posts (101,257 followers)
- One Twitter post (283,000 followers)



WSDOT

January 2019

Puget Sound Gateway Program

SR 167 Completion Project Phase 1 Improvements Environmental Review

In 2018, the Washington State Department of Transportation (WSDOT) updated certain elements of the SR 167 Completion Project Tier II Environmental Impact Assessment - Phase 1. WSDOT and the Federal Highway Administration (FHWA) want your feedback on the findings of a National Environmental Policy Act (NEPA) Re-Evaluation, which analyzes whether there are any new potentially significant environmental effects of these SR 167 Completion Project - Phase 1 improvements.

About the SR 167 Completion Project

The SR 167 Completion Project will build the remaining four miles of SR 167 between N. Meridian Avenue (SR 161) in Puyallup and I-5 in Fife. The project also includes a two-mile connection from I-5 to SR 509 near the Port of Tacoma. A completed SR 167 will benefit freight movement and access to the Port of Tacoma, while improving safety and reducing congestion on local roads and highways in the surrounding area.

Key findings

- Smaller project footprint
- Enhanced stormwater treatment
- Reduced wetland impacts
- Consistent with regional plans
- Improved traffic operations
- Fewer noise impacts
- Effects of tolling
- Fewer property displacements

Visit SR167OpenHouse.org to learn more and provide feedback.

The mailer sent to addresses within a half-mile radius of the project alignment contained key findings, a vicinity map and directions to leave a comment.

We mailed a notification to all residents and businesses within a half-mile radius of the entire SR 167 Project alignment, a total of 4,086 addresses. The notification was in the form of a folio, which included key information and a map of the project. The back of the mailer contained information about nearby libraries with hard copies of the report and both an email and mailing address to send comments for those who did not use the online open house site. The information on the back of the mailer was translated into Spanish.

A total of 2,430 individuals received a notification about the online open house via email.

A link to the online open house was also included in the Project News section of the SR 167 Completion Project and Puget Sound Gateway webpages and posted to WSDOT's Facebook and Twitter account.

Website Traffic and Social Shares

The online open house received 881 unique visitors during the 30-day comment period, 128 of whom accessed the Comment page.

WSDOT posted a link to the online open house twice on Facebook and once on Twitter. The Facebook posts were shared a total of 27 times and received a total of 99 reactions and 21 comments. The Twitter post received one like and one comment.

Comment Summary

WSDOT invited the community to submit comments through the online open house, via a project email and by postal mail. We received a total of 10 comments – one via email and nine through the online open house.

None of the comments we received addressed the findings of the NEPA Re-Evaluation, but focused instead on various aspects of the project, including:

- Tolling
- Project timeline
- Local congestion and problem areas
- Project design
- Signals/signage

The SR 167 Project team prepared responses to the comments. The comments and responses are provided in the following section of this summary. WSDOT has posted this summary to the SR 167 Completion Project webpage and the online open house site, which will remain live for 12 months. Everyone who submitted a comment has received an email from WSDOT which contains a link to this summary.



Facebook posts on January 16 and February 13 drove traffic to the online open house.